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Coconino National Forest Land and Resource Management Plan

Final Environmental Impact Statement

Volume III. Appendices

Forest Service

Coconino National Forest

Southwestern Region

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March 2018

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Final Environmental Impact Statement for the Coconino National Forest Land and Resource Management Plan

Coconino, Gila, and Yavapai Counties, Arizona

Volume III. Appendices

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Abstract: To comply with the National Forest Management Act and address changes that have occurred over the past 30 years, the Coconino National Forest proposes to revise the current land management plan (1987 plan). This programmatic final environmental impact statement (FEIS) documents analysis of the impacts of four alternatives developed for programmatic management of the 1.8 million acres administered by the Coconino National Forest. The analysis displays the anticipated progress toward the desired conditions as well as the potential environmental and social consequences of implementing each alternative. Alternative A is the no-action alternative, which is the1987 forest plan, as amended. Alternative B (modified) is the preferred alternative and is reflected in the accompanying Final Land and Resource Management Plan for the Coconino National Forest. This alternative addresses new information and concerns received since the 1987 forest plan was published, and it meets objectives of Federal laws, regulations, and policies. Alternative C considers increases in the amount of wilderness and special areas, as well as increased opportunities for semi-primitive recreation. Alternative D considers fewer restrictions on human access, use, and infrastructure.

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Final Environmental Impact Statement for the Coconino National Forest Land and Resource Management Plan

Volume III. Appendices

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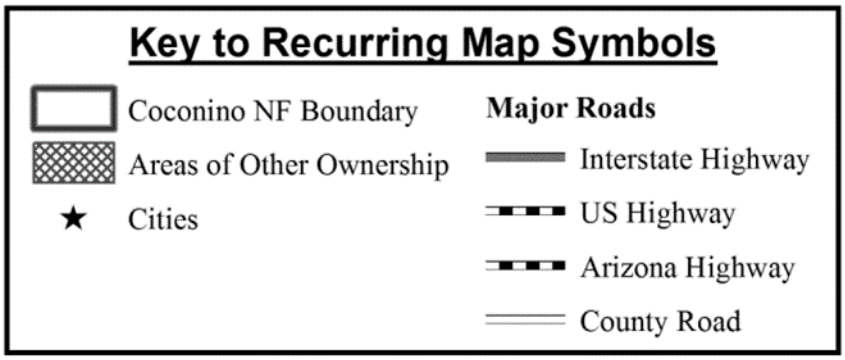
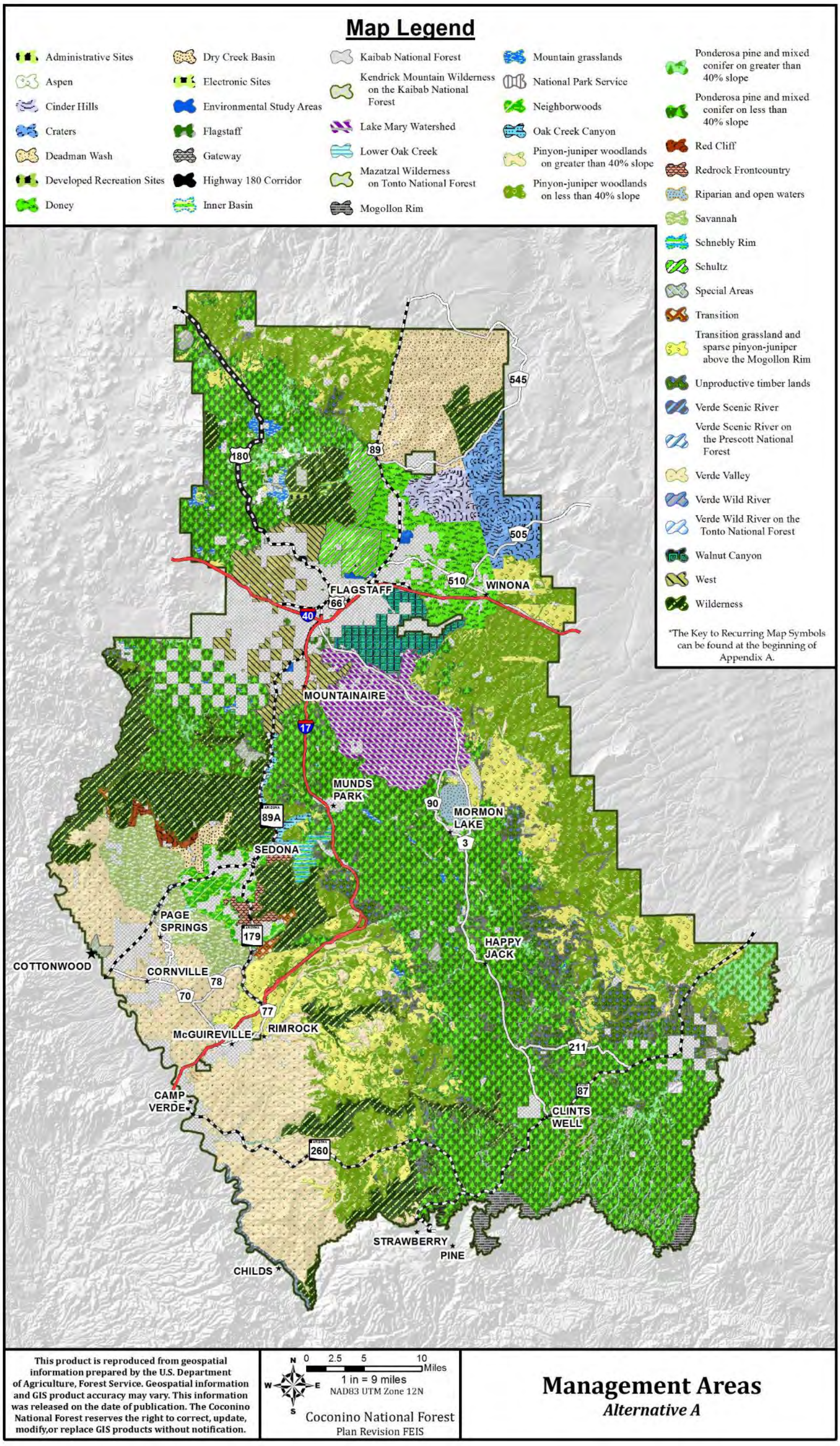
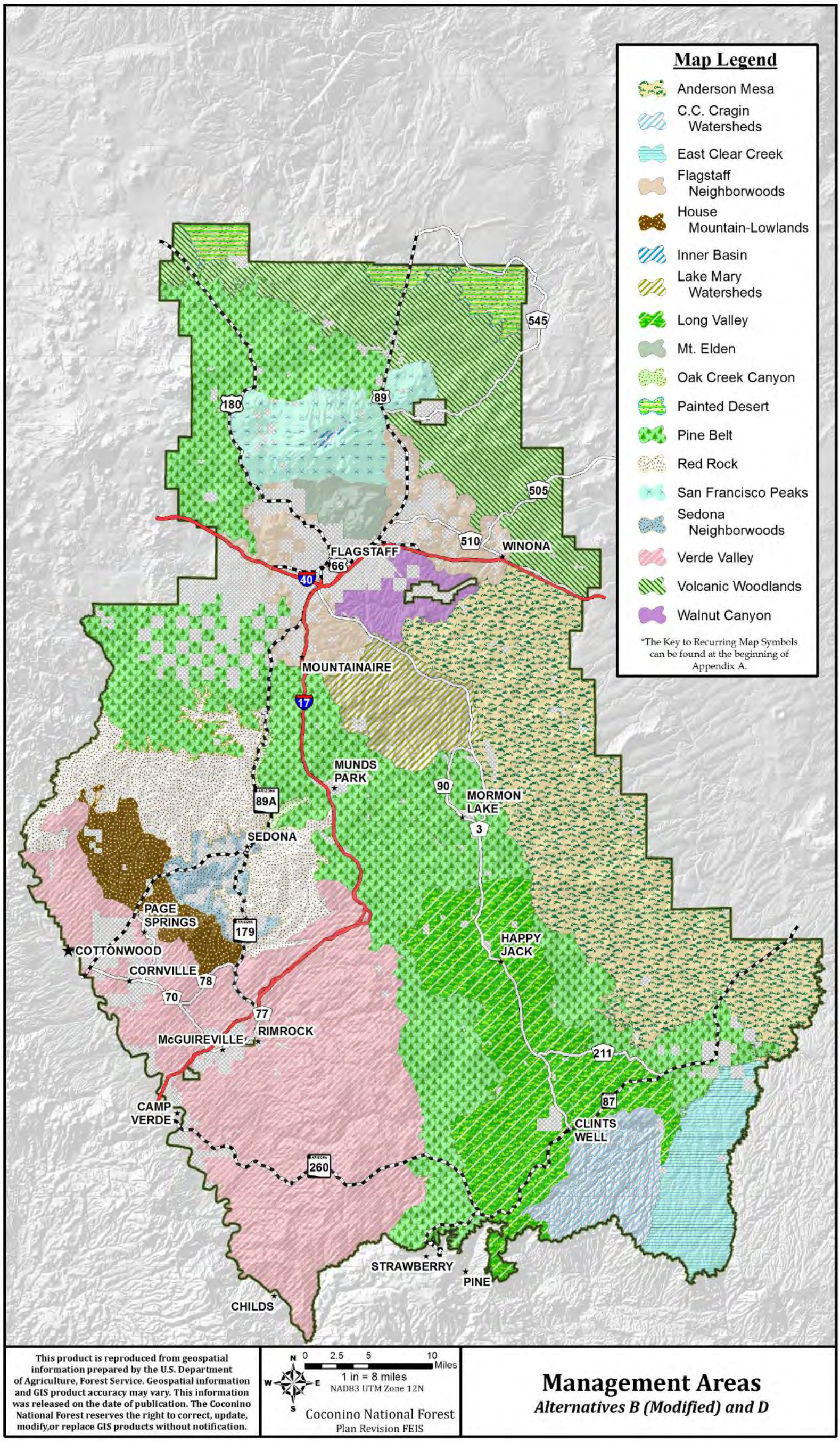


For printing: Maps 1 to 4 are formatted to be printed on paper sized at 11 x 17 inches. For printers limited to sheets sized at 8½ x 11 inches, the appropriate settings (e.g., "Fit to Page") will need to be adjusted to ensure that these maps are plotted successfully to your printer.



Map 1. Management Areas – Alternative A



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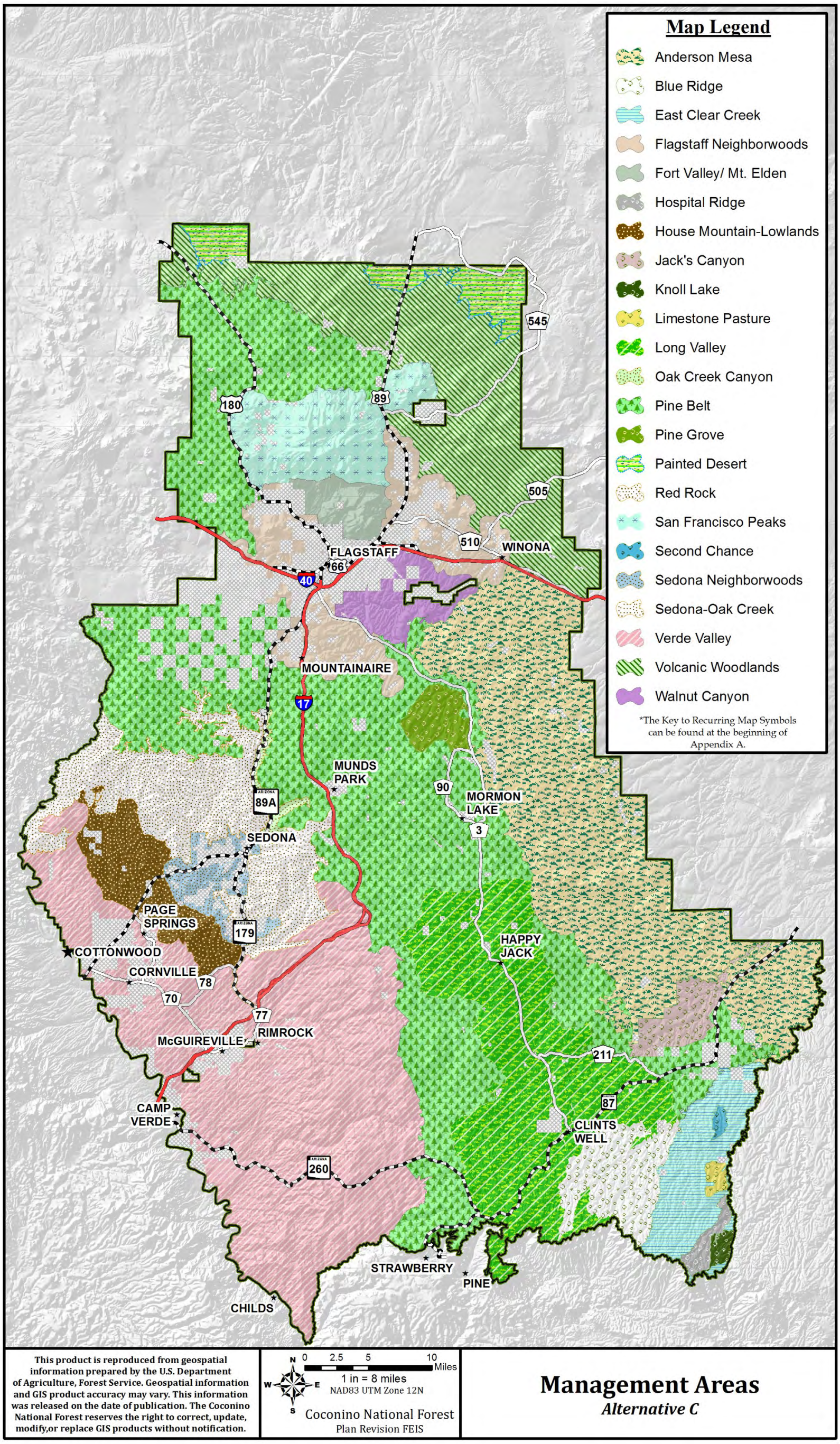

Map 3. Management Areas – Alternative C

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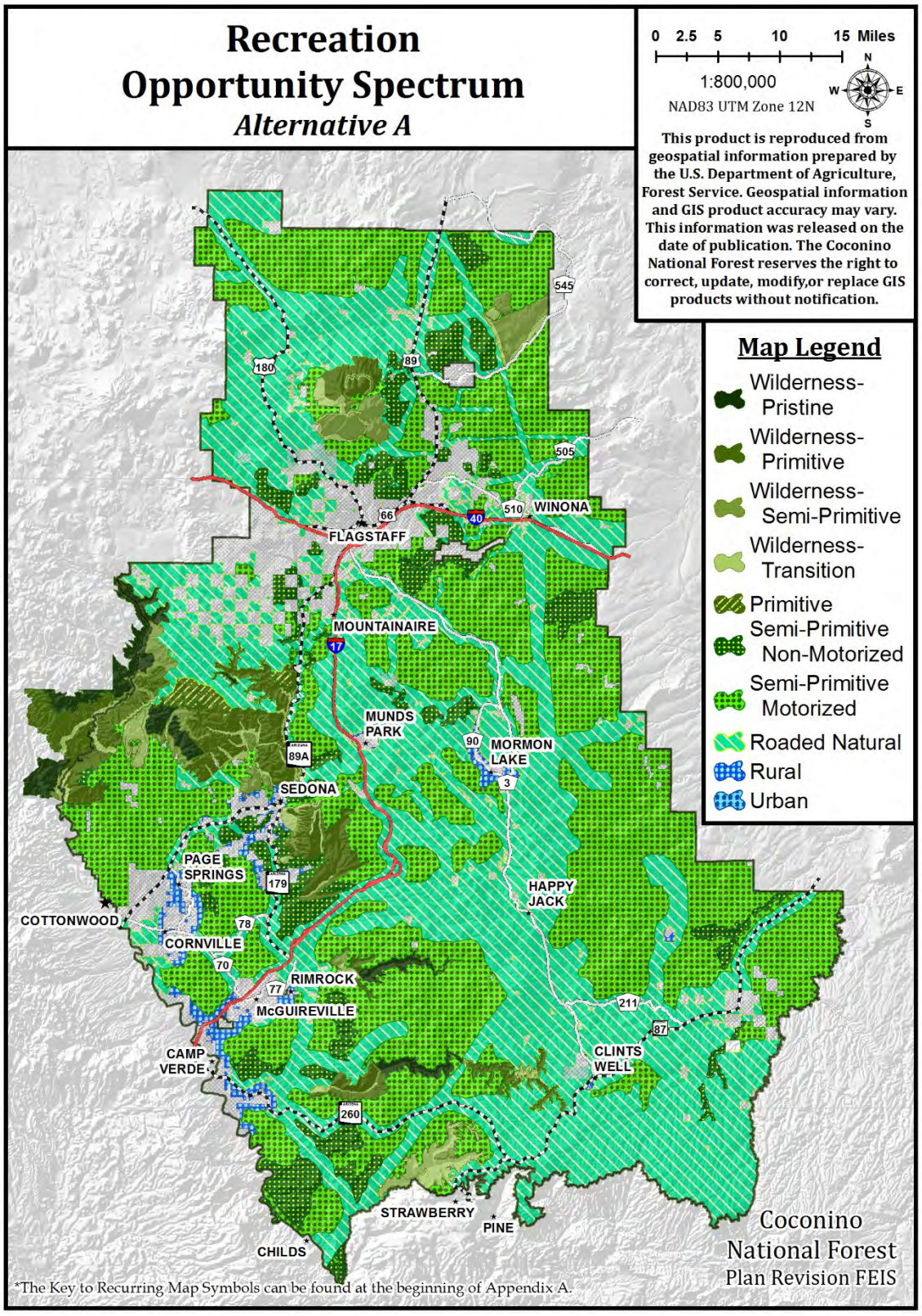
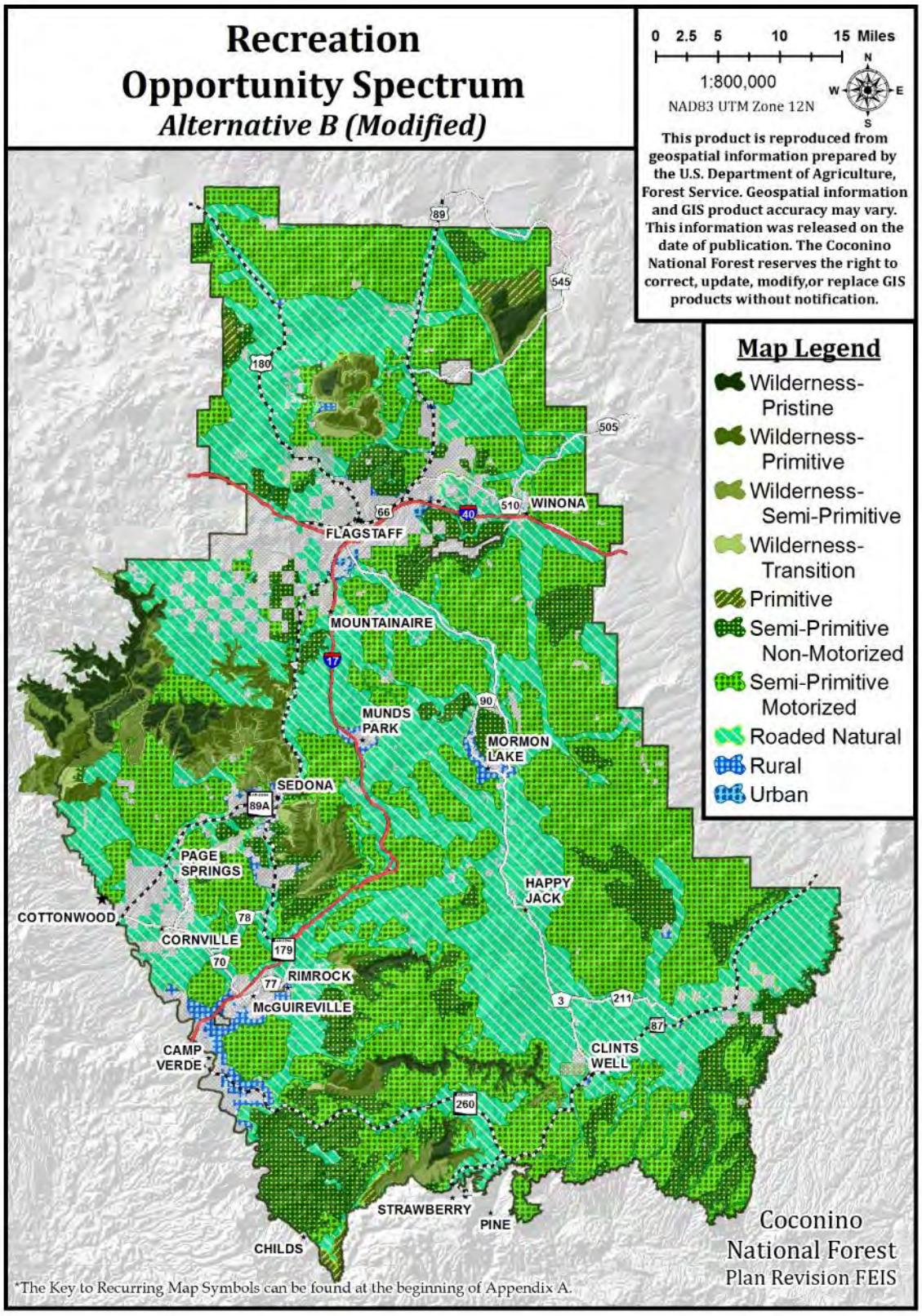
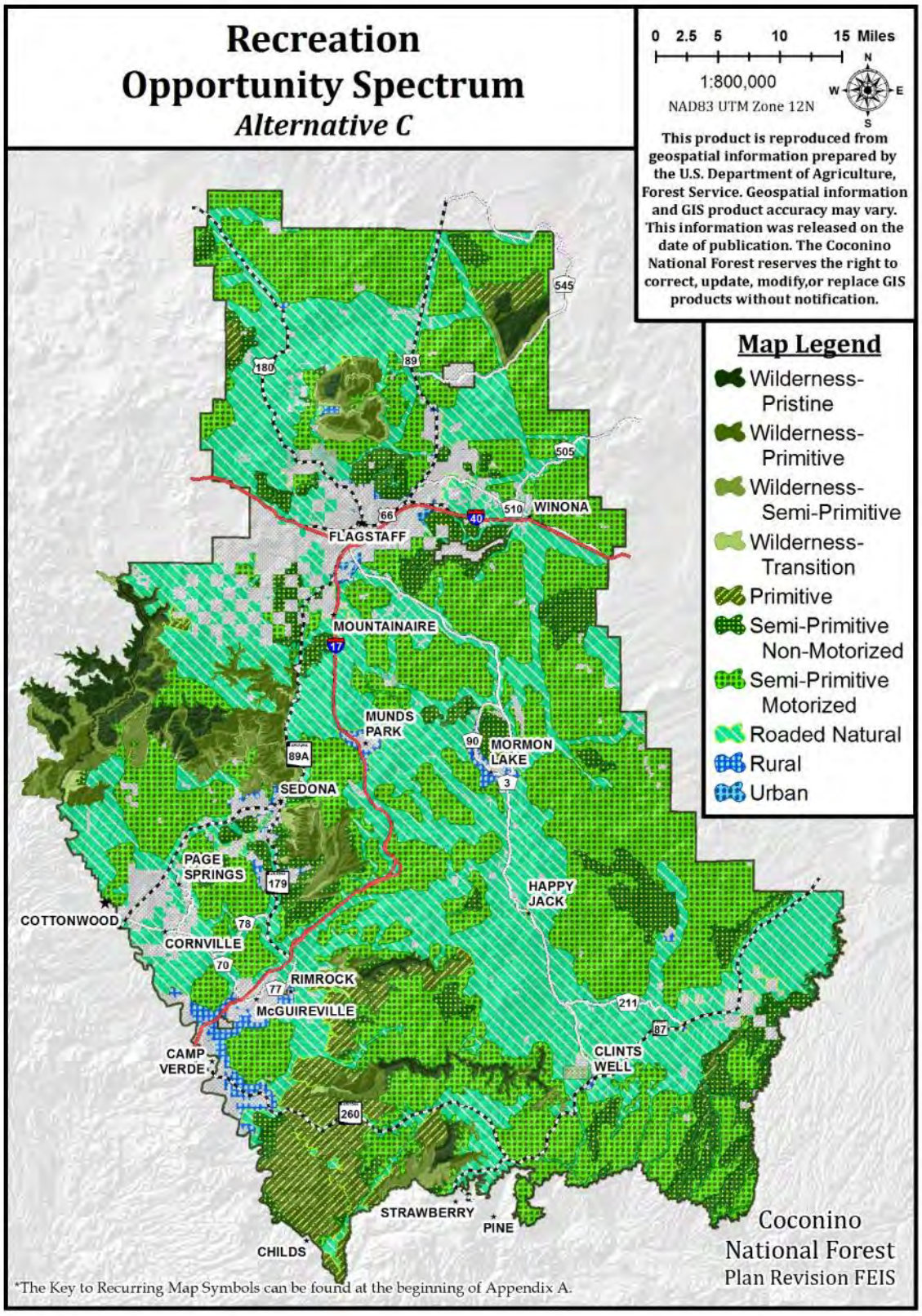


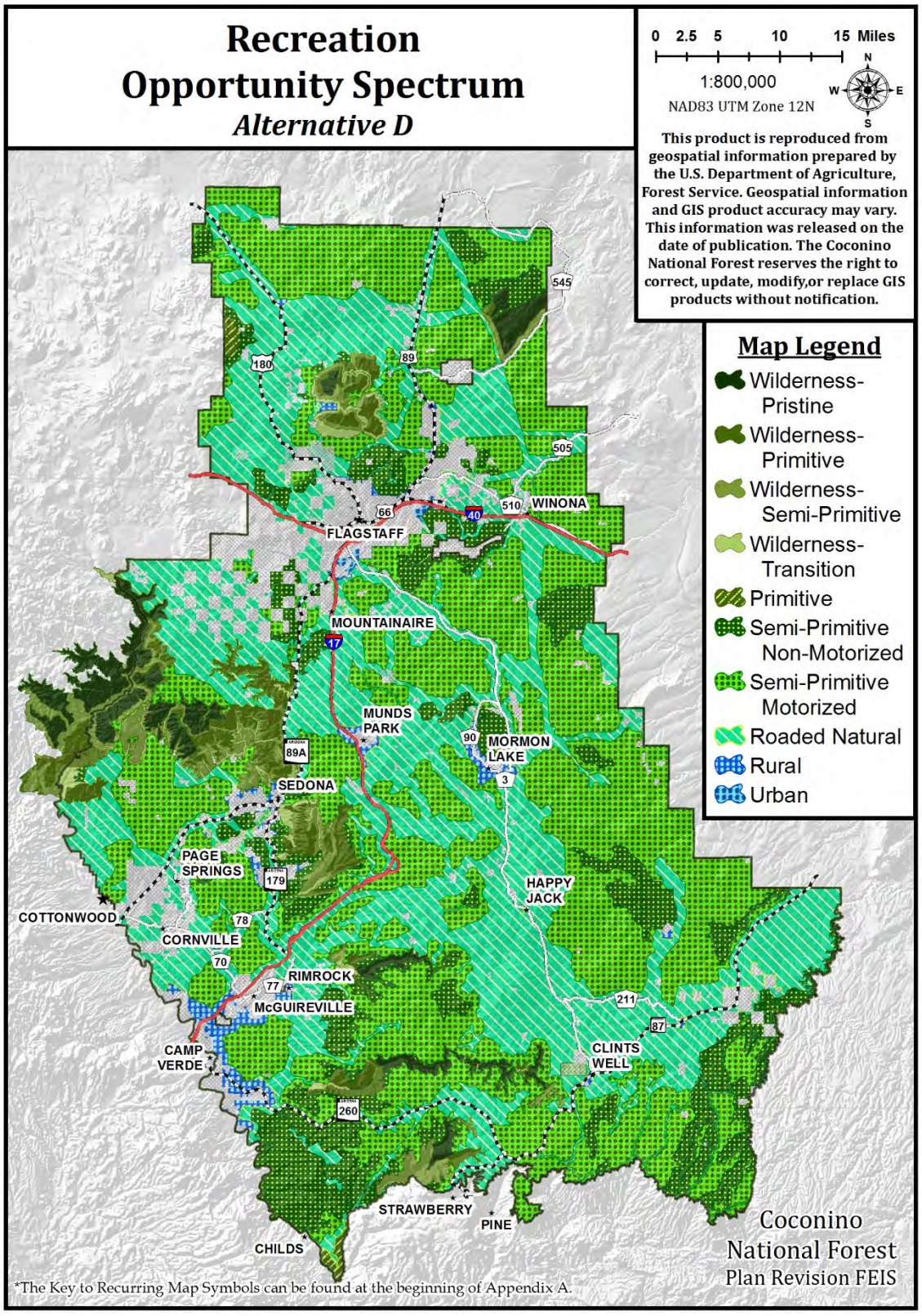
Map 4. Recreation Opportunity Spectrum – Alternative A



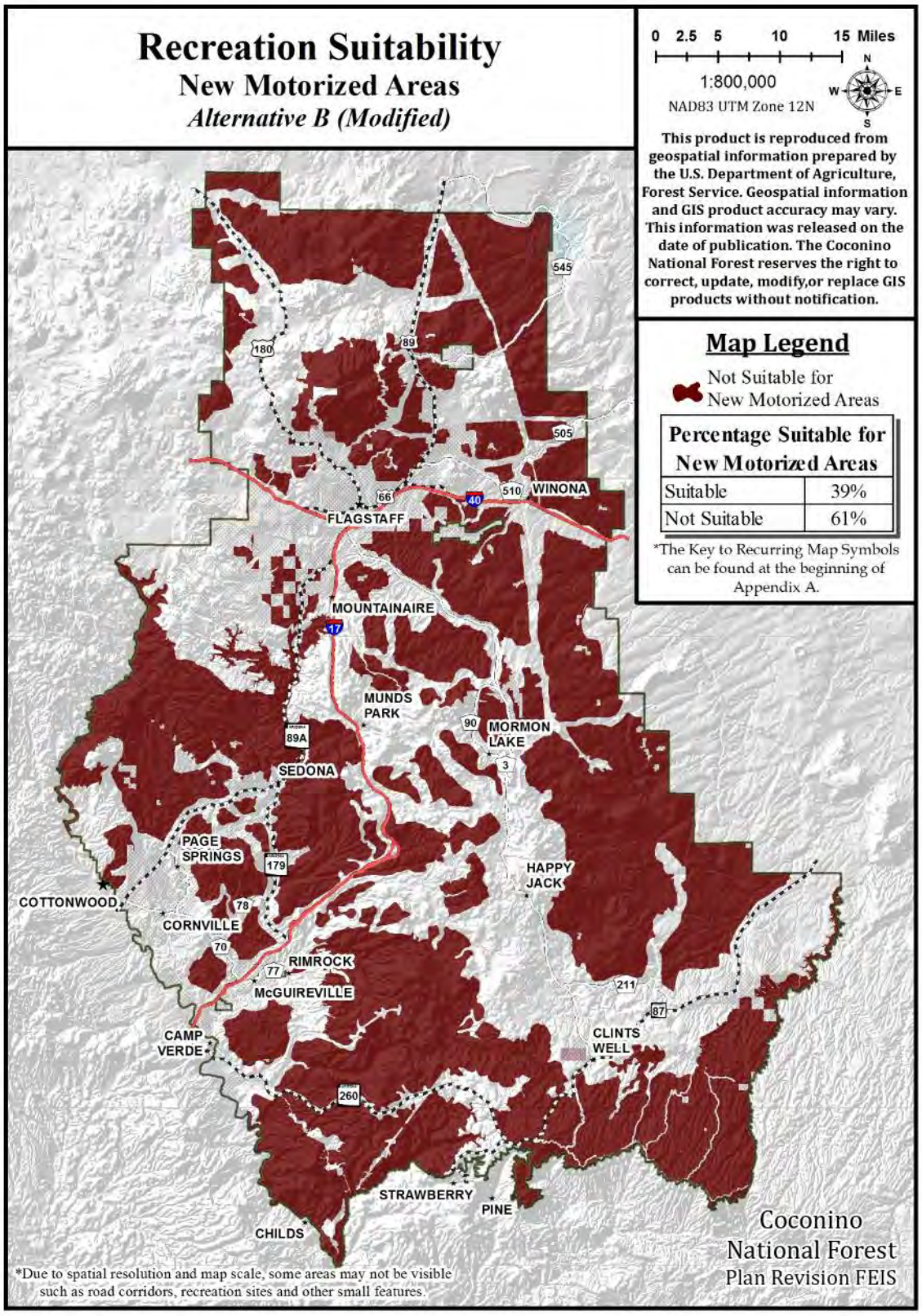
Map 5. Recreation Opportunity Spectrum – Alternative B (modified)



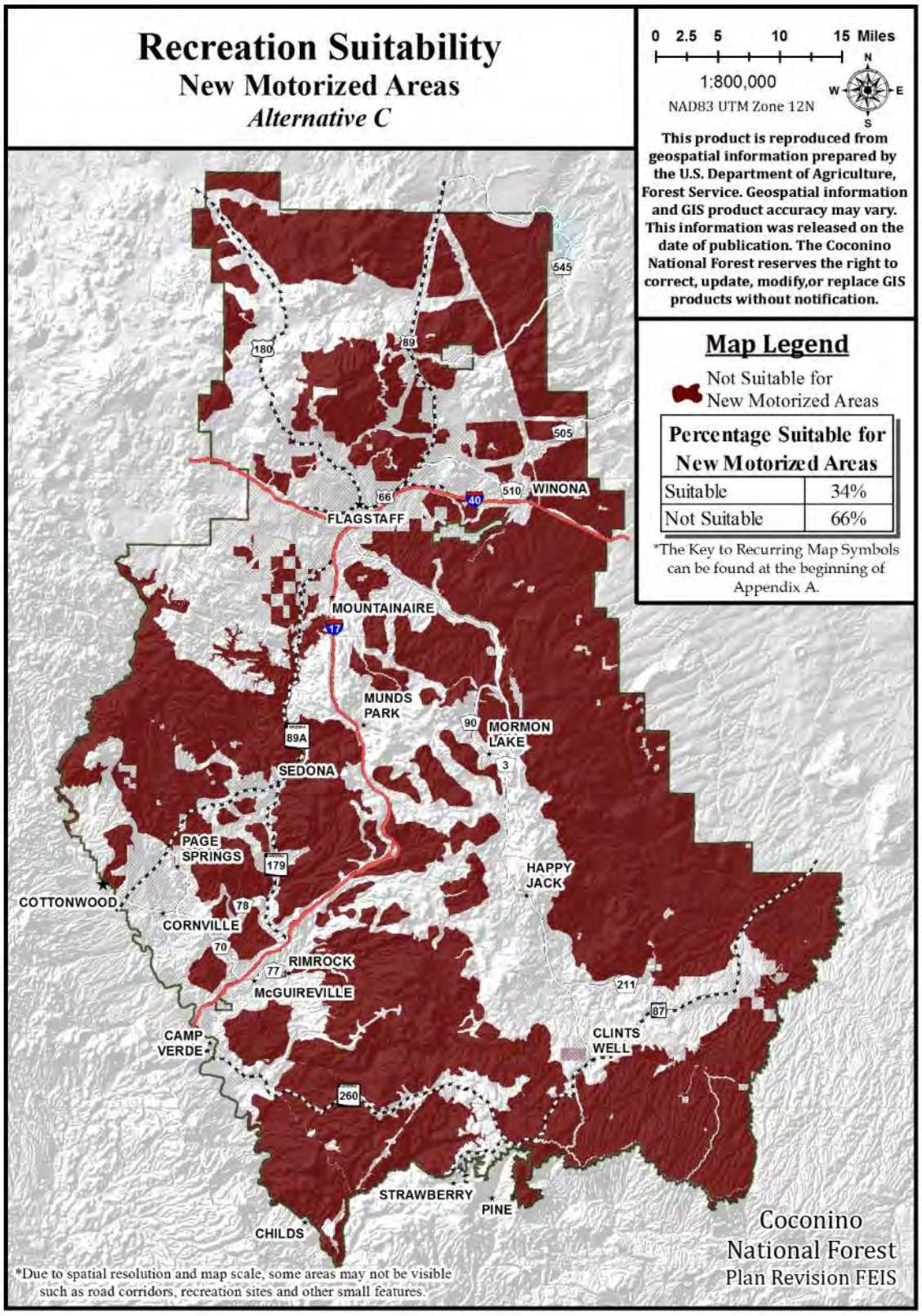
Map 6. Recreation Opportunity Spectrum – Alternative C



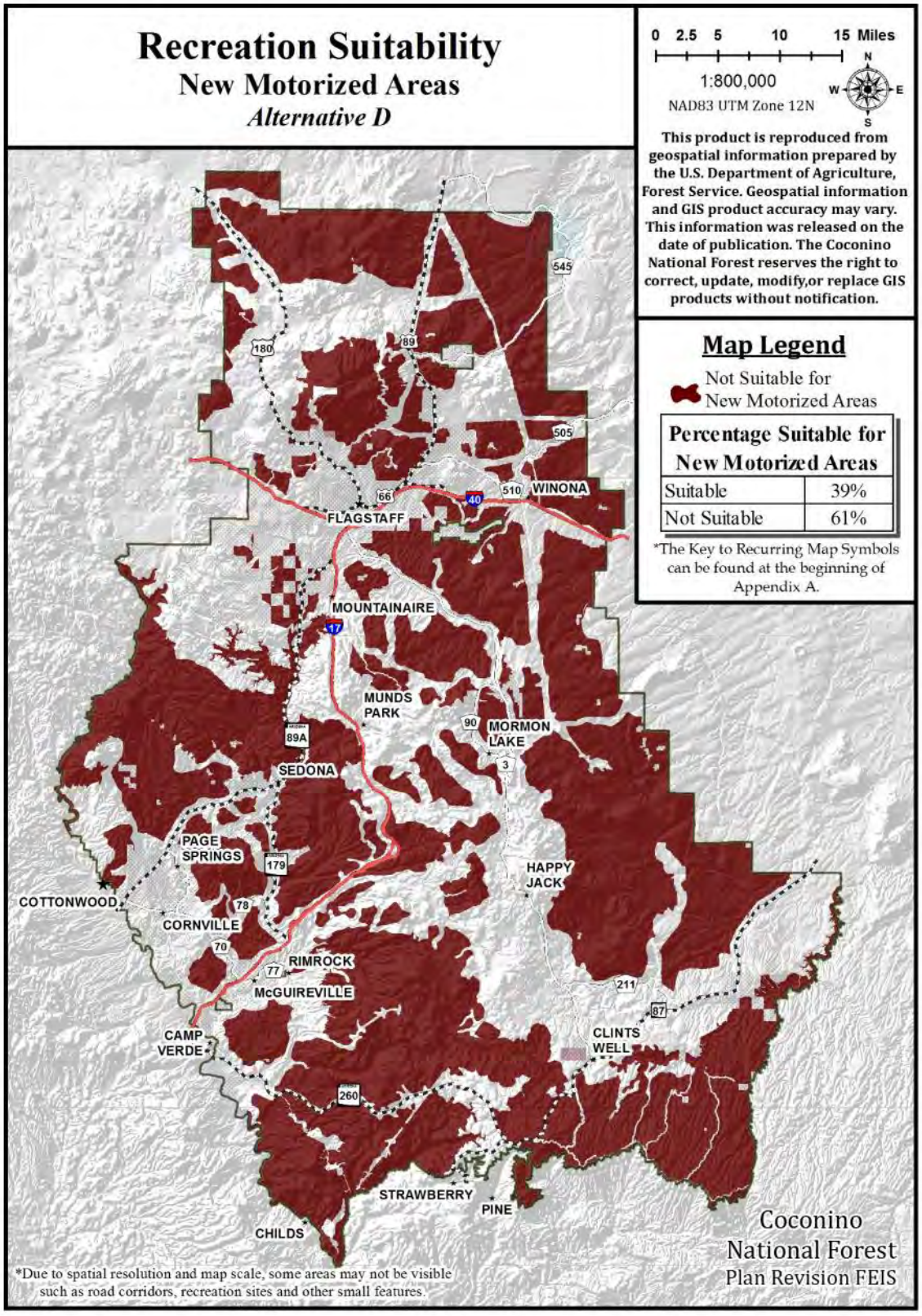
Map 7. Recreation Opportunity Spectrum – Alternative D



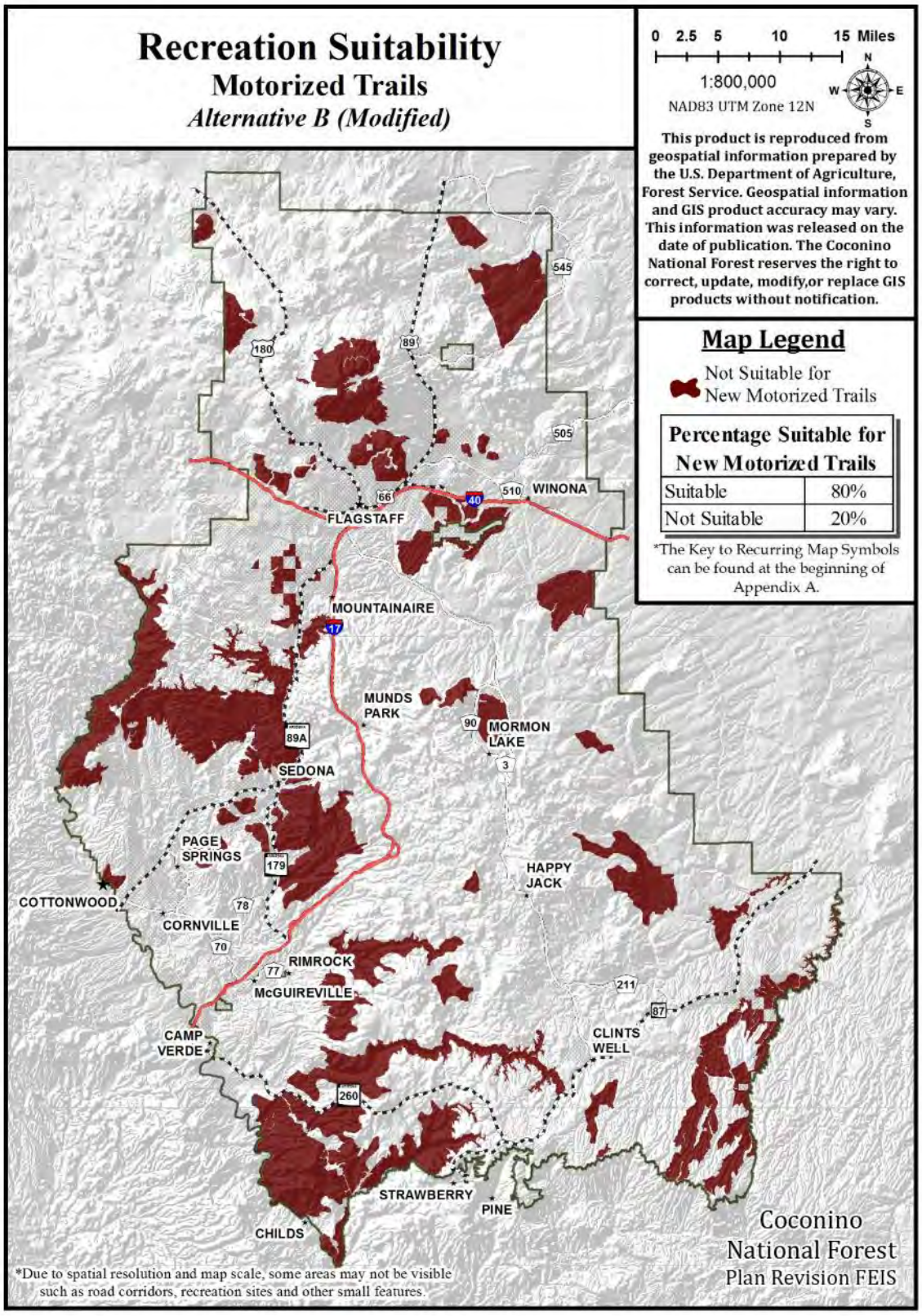
Map 8. Recreation Suitability – New Motorized Areas – Alternative B (modified)



Map 9. Recreation Suitability – New Motorized Areas – Alternative C



Map 10. Recreation Suitability – New Motorized Areas – Alternative D


Recreation Suitability
Motorized Trails
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Map Legend
Not Suitable for New Motorized Trails
Percentage Suitable for New Motorized Trails
Suitable 80%
Not Suitable 20%
*The Key to Recurring Map Symbols can be found at the beginning of Appendix A.
FLAGSTAFF
WINONA
MOUNTAINAIRE
MUNDS PARK
MORMON LAKE
SEDONA
PAGE SPRINGS
COTTONWOOD
CORNVILLE
RIMROCK
McGUIREVILLE
CAMP VERDE
HAPPY JACK
CLINTS WELL
STRAWBERRY
PINE
CHILDS
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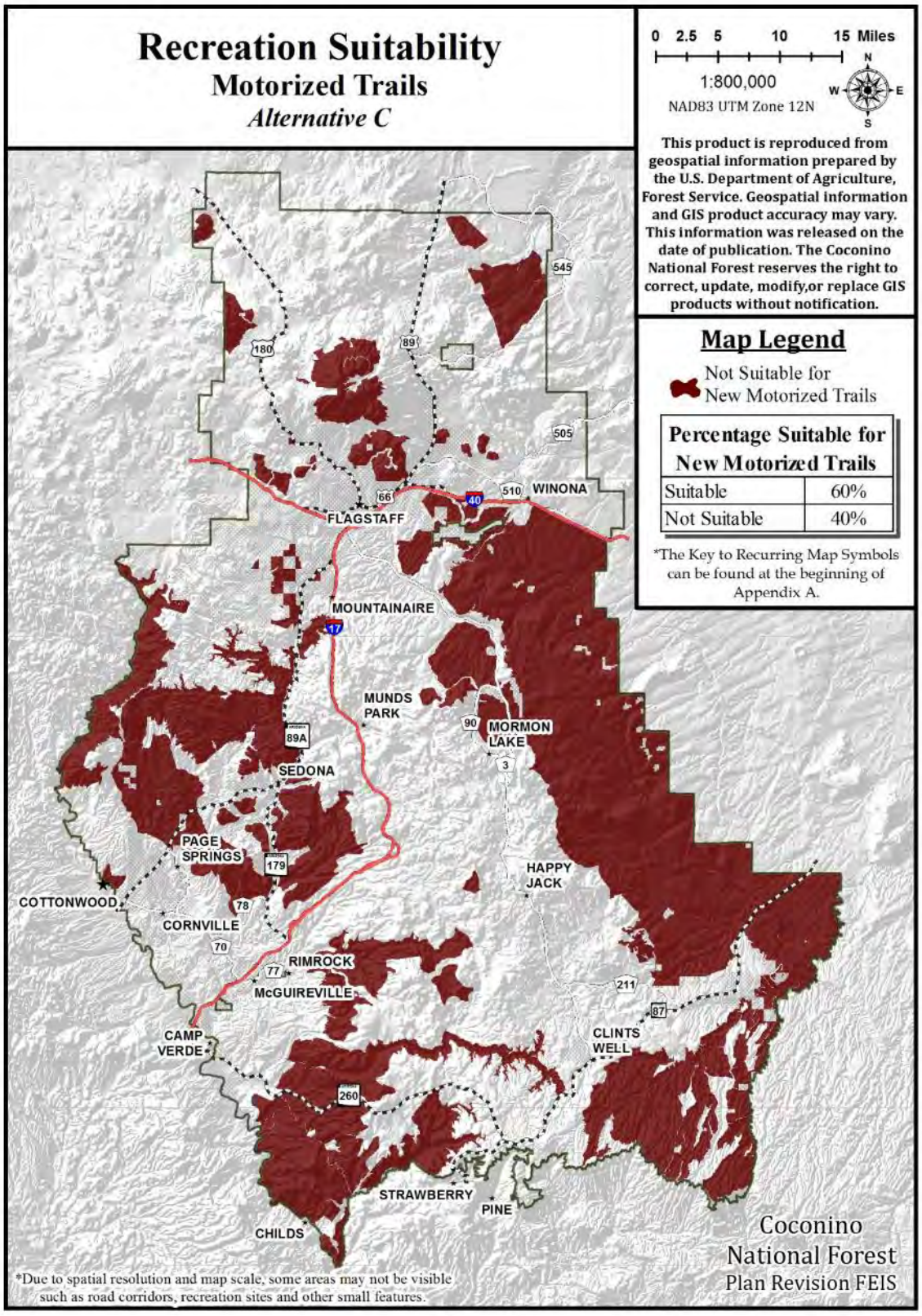
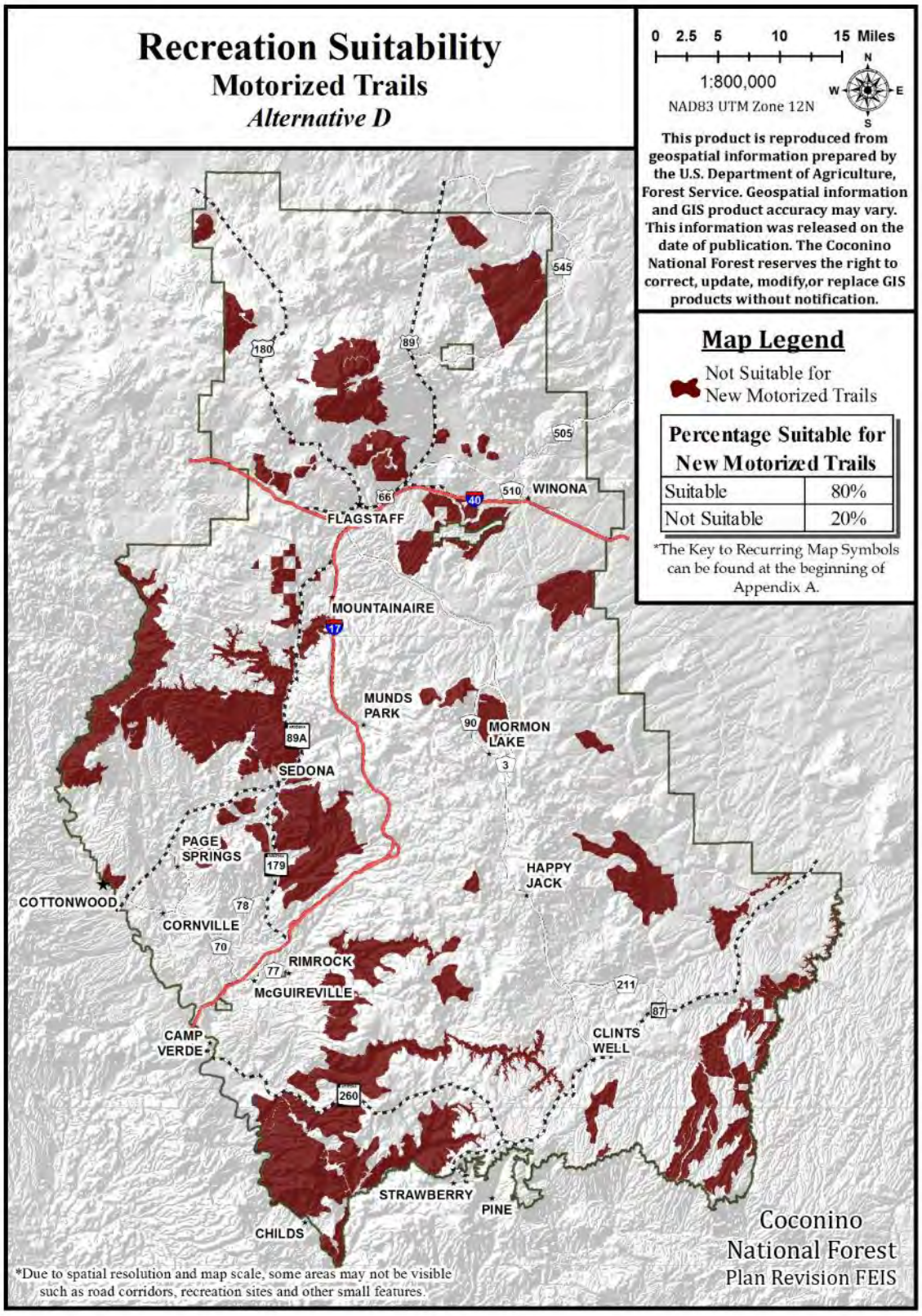
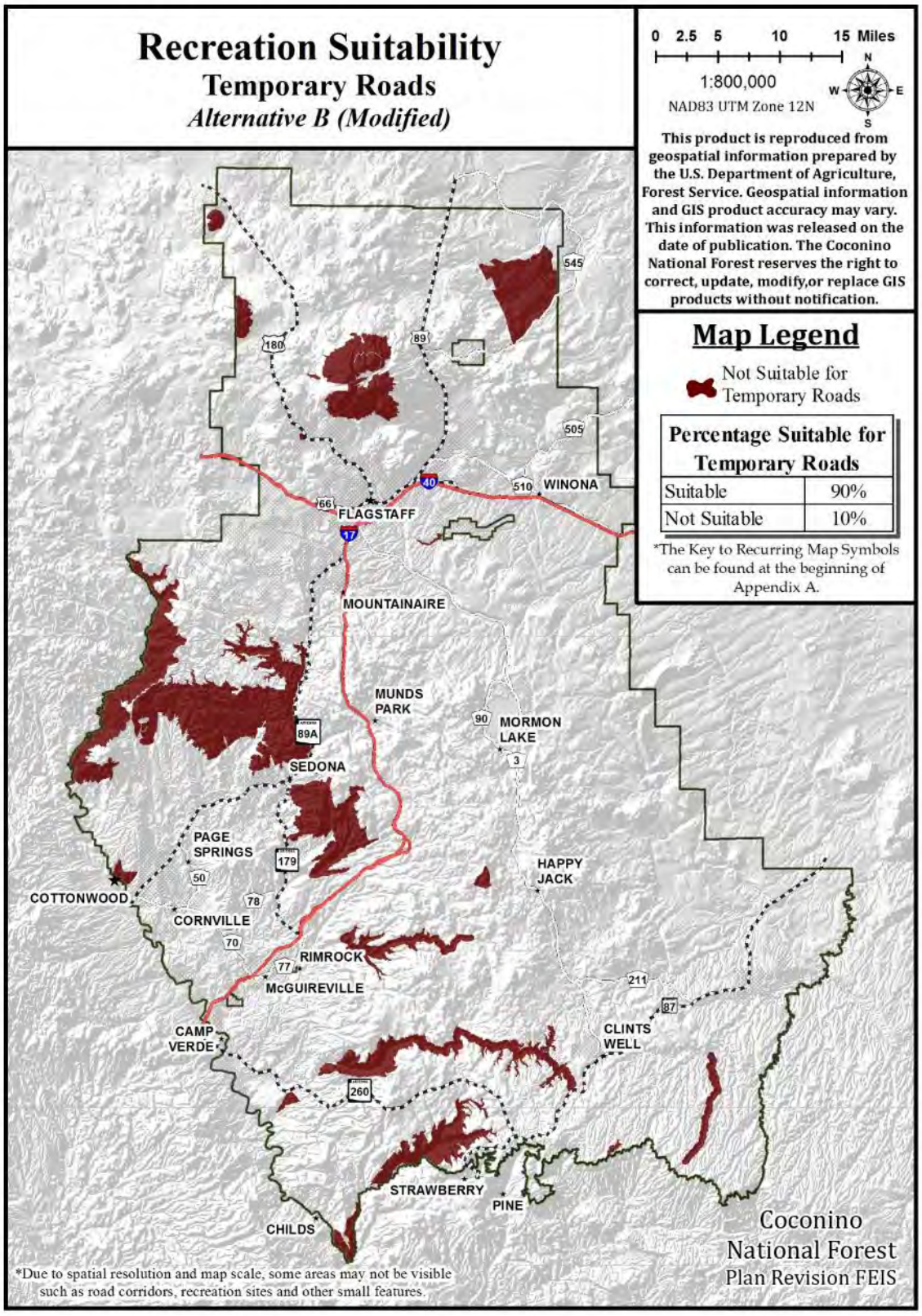
Map 11. Recreation Suitability – Motorized Trails – Alternative B (modified)



Map 12. Recreation Suitability – Motorized Trails – Alternative C



Map 13. Recreation Suitability – Motorized Trails – Alternative D


Recreation Suitability
Temporary Roads
Alternative B (Modified)
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Map Legend
Not Suitable for Temporary Roads
Percentage Suitable for Temporary Roads
Suitable 90%
Not Suitable 10%
*The Key to Recurring Map Symbols can be found at the beginning of Appendix A.
FLAGSTAFF
WINONA
MOUNTAINAIRE
MUNDS PARK
MORMON LAKE
SEDONA
PAGE SPRINGS
COTTONWOOD
CORNVILLE
RIMROCK
McGUIREVILLE
CAMP VERDE
HAPPY JACK
CLINTS WELL
STRAWBERRY
PINE
CHILDS
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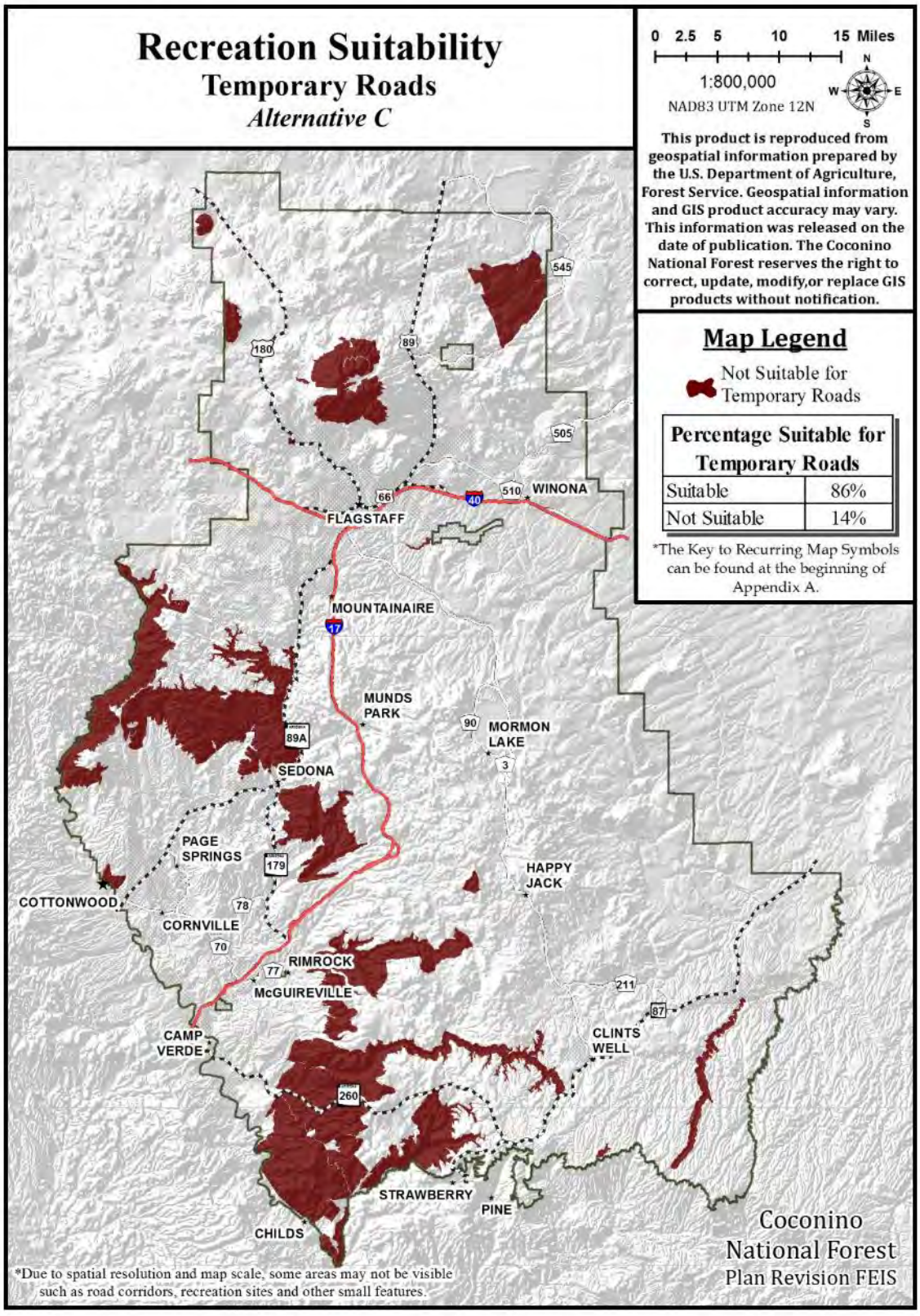
Map 14. Recreation Suitability – Temporary Roads – Alternative B (modified)


Recreation Suitability
Temporary Roads
Alternative C
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NAD83 UTM Zone 12N
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Map Legend
Not Suitable for Temporary Roads
Percentage Suitable for Temporary Roads
Suitable 86%
Not Suitable 14%
*The Key to Recurring Map Symbols can be found at the beginning of Appendix A.
FLAGSTAFF
WINONA
MOUNTAINAIRE
MUNDS PARK
MORMON LAKE
SEDONA
PAGE SPRINGS
COTTONWOOD
CORNVILLE
HAPPY JACK
RIMROCK
McGUIREVILLE
CAMP VERDE
CLINTS WELL
STRAWBERRY
PINE
CHILDS
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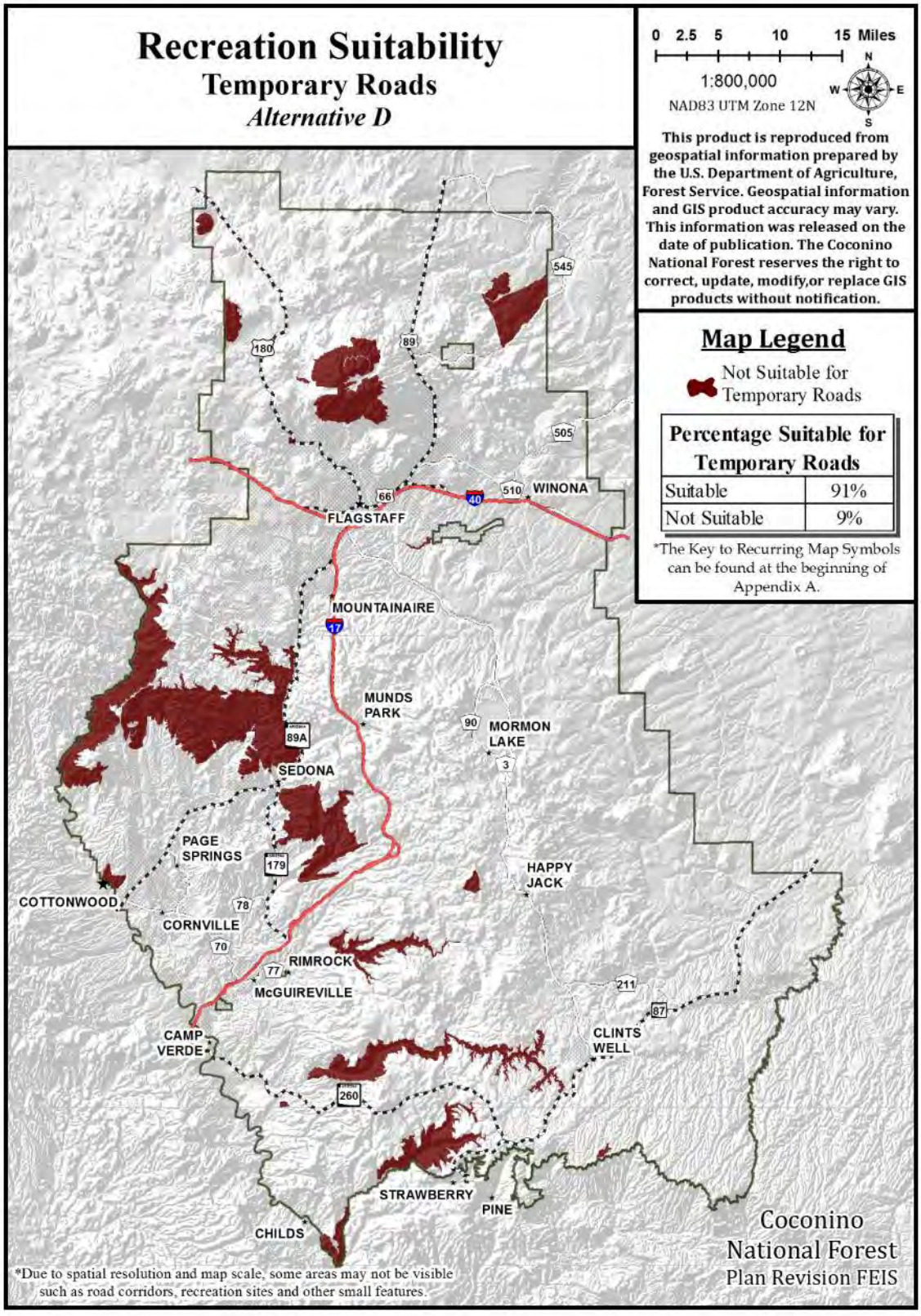
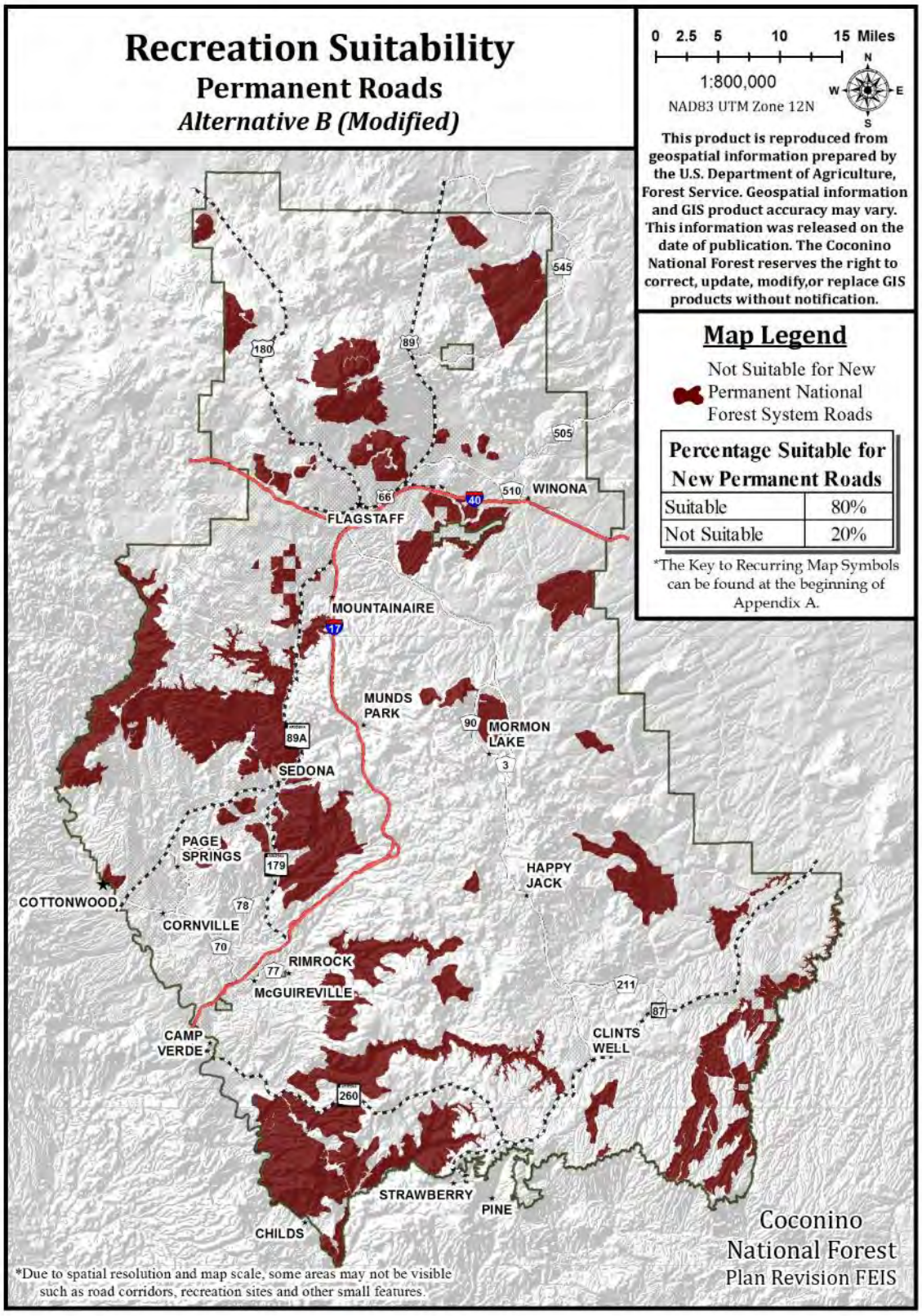
Map 15. Recreation Suitability – Temporary Roads – Alternative C



Map 16. Recreation Suitability – Temporary Roads – Alternative D


Recreation Suitability
Permanent Roads
Alternative B (Modified)
0 2.5 5 10 15 Miles
1:800,000
NAD83 UTM Zone 12N
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E
S
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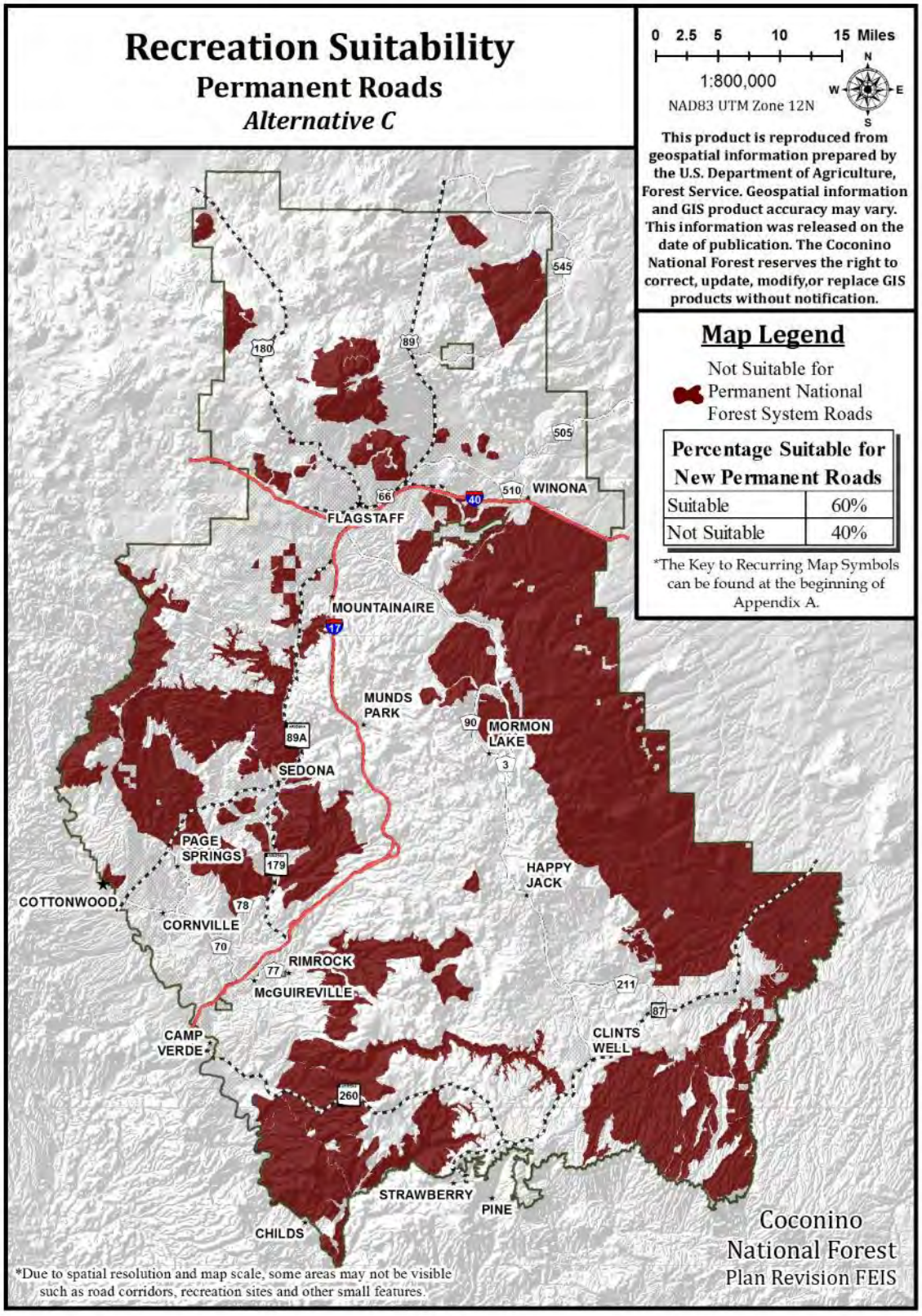
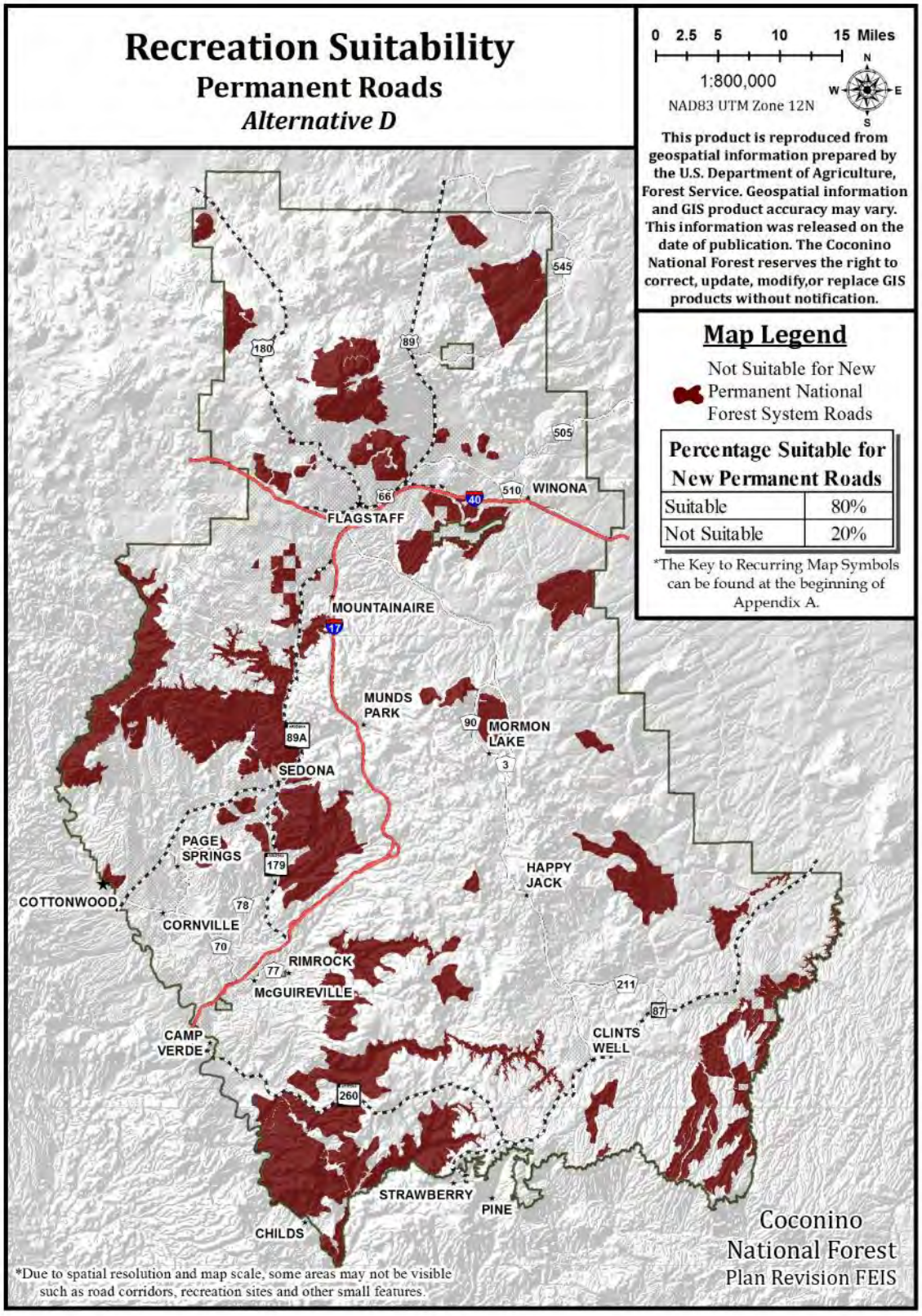
Map Legend
Not Suitable for New Permanent National Forest System Roads
Percentage Suitable for New Permanent Roads
Suitable 80%
Not Suitable 20%
*The Key to Recurring Map Symbols can be found at the beginning of Appendix A.
FLAGSTAFF
WINONA
MOUNTAINAIRE
MUNDS PARK
MORMON LAKE
SEDONA
PAGE SPRINGS
COTTONWOOD
CORNVILLE
RIMROCK
McGUIREVILLE
CAMP VERDE
HAPPY JACK
CLINTS WELL
STRAWBERRY
PINE
CHILDS
*Due to spatial resolution and map scale, some areas may not be visible such as road corridors, recreation sites and other small features.
Coconino National Forest
Plan Revision FEIS

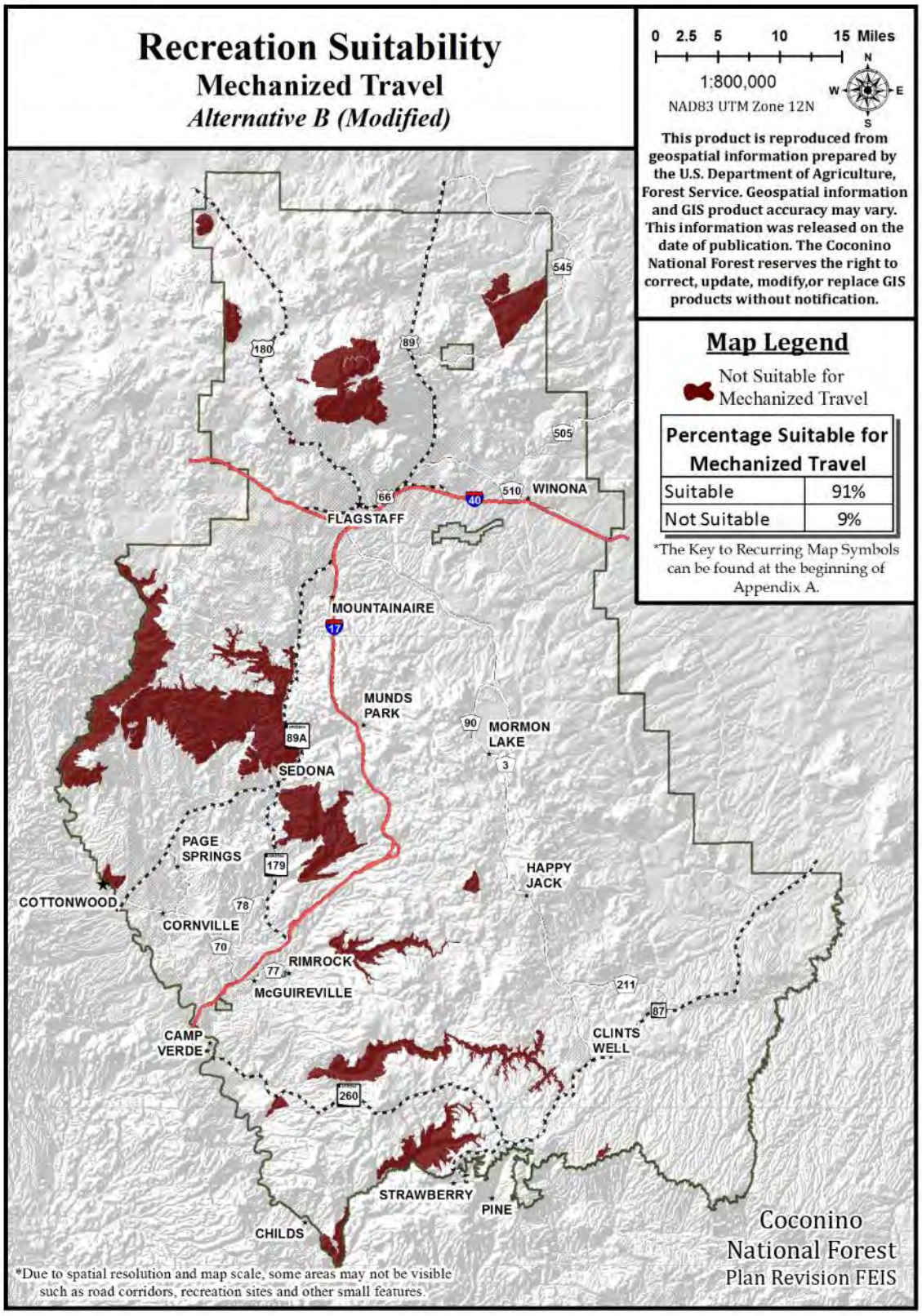
Map 17. Recreation Suitability – Permanent Roads – Alternative B (modified)



Map 18. Recreation Suitability – Permanent Roads – Alternative C



Map 19. Recreation Suitability – Permanent Roads – Alternative D


Recreation Suitability
Mechanized Travel
Alternative B (Modified)
0 2.5 5 10 15 Miles
1:800,000
NAD83 UTM Zone 12N
N
W
E
S
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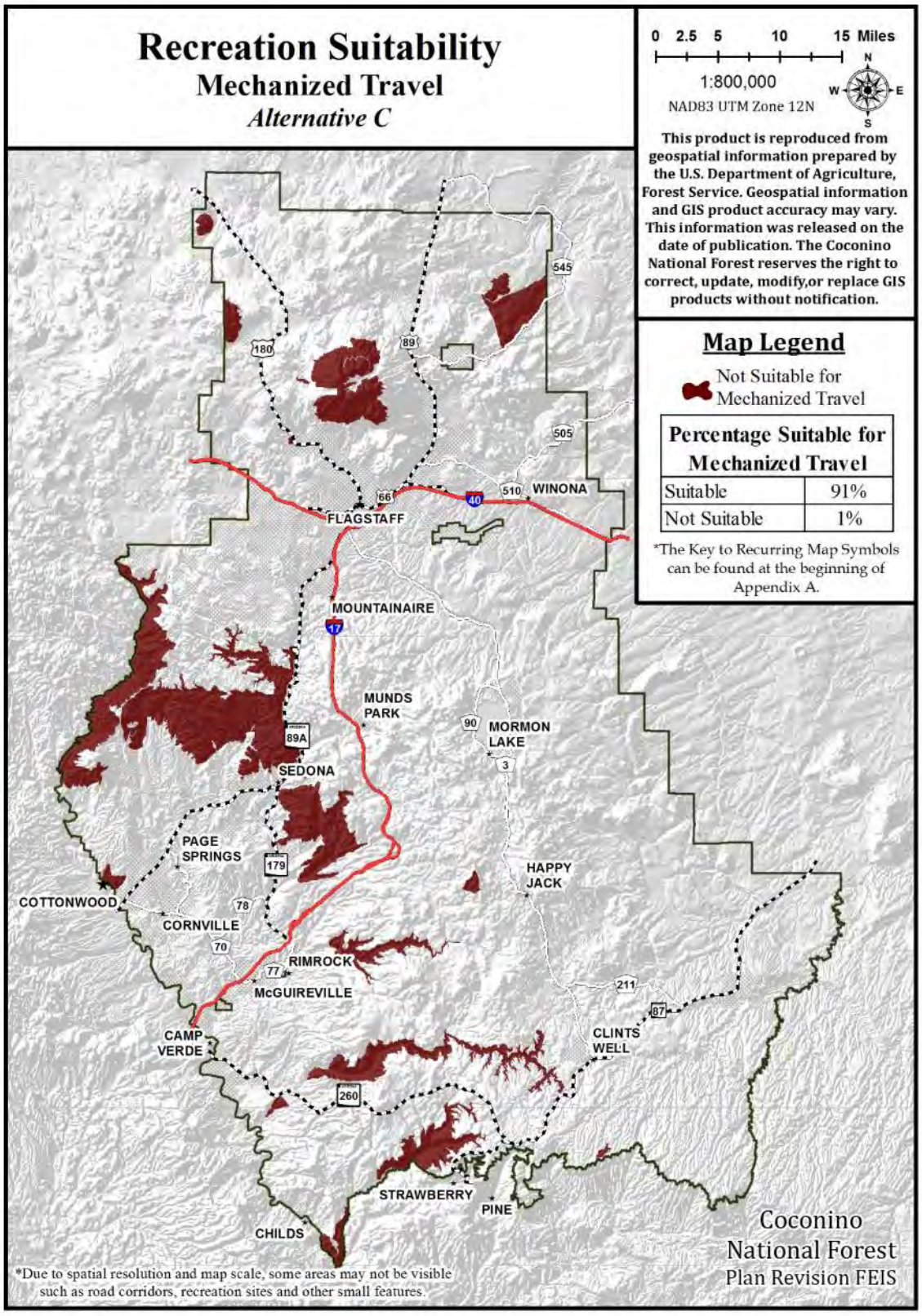
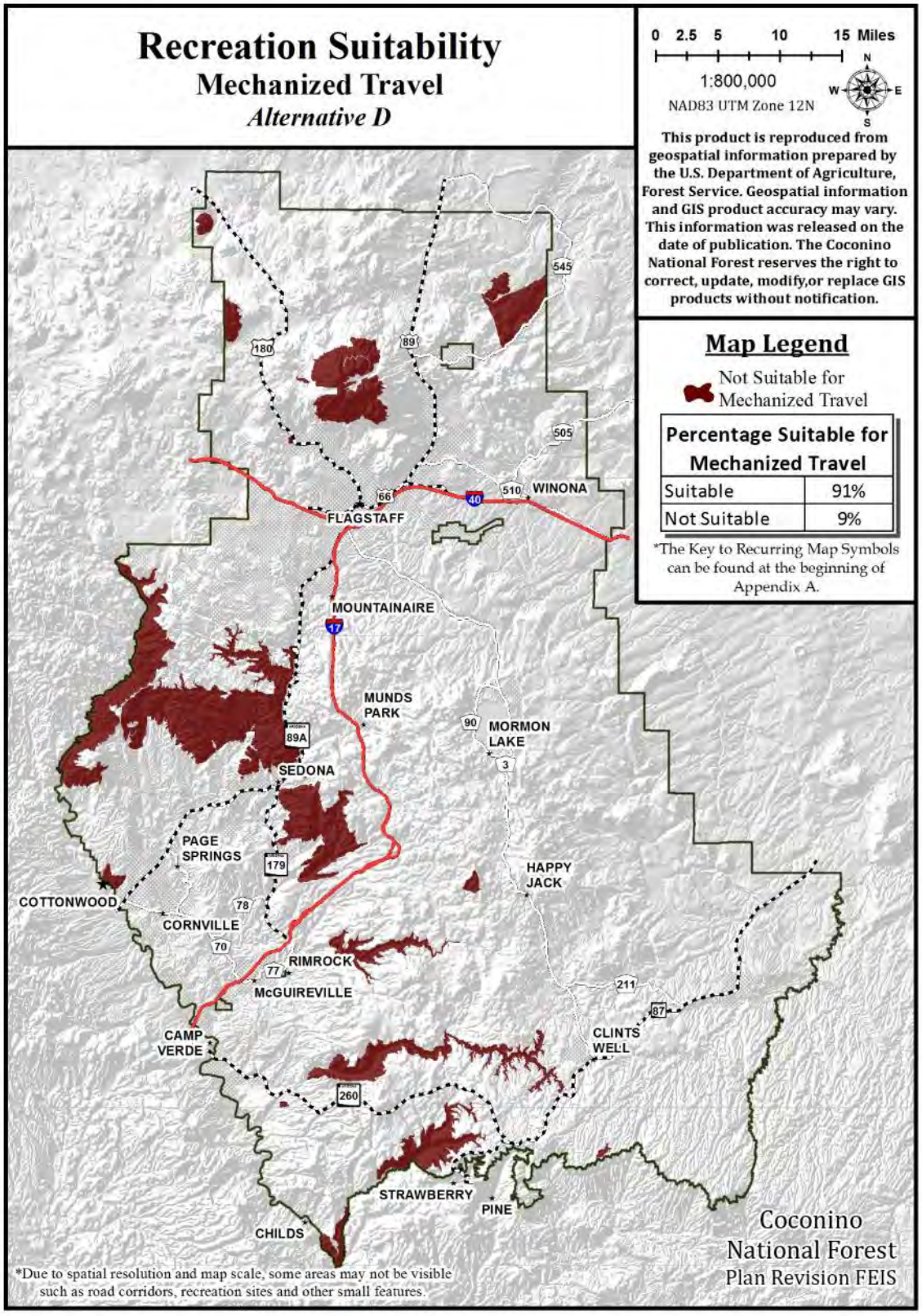
Map Legend
Not Suitable for Mechanized Travel
Percentage Suitable for Mechanized Travel
Suitable 91%
Not Suitable 9%
*The Key to Recurring Map Symbols can be found at the beginning of Appendix A.
FLAGSTAFF
WINONA
MOUNTAINAIRE
MUNDS PARK
MORMON LAKE
SEDONA
PAGE SPRINGS
COTTONWOOD
CORNVILLE
RIMROCK
McGUIREVILLE
HAPPY JACK
CLINTS WELL
CAMP VERDE
STRAWBERRY
PINE
CHILDS
*Due to spatial resolution and map scale, some areas may not be visible such as road corridors, recreation sites and other small features.
Coconino National Forest
Plan Revision FEIS

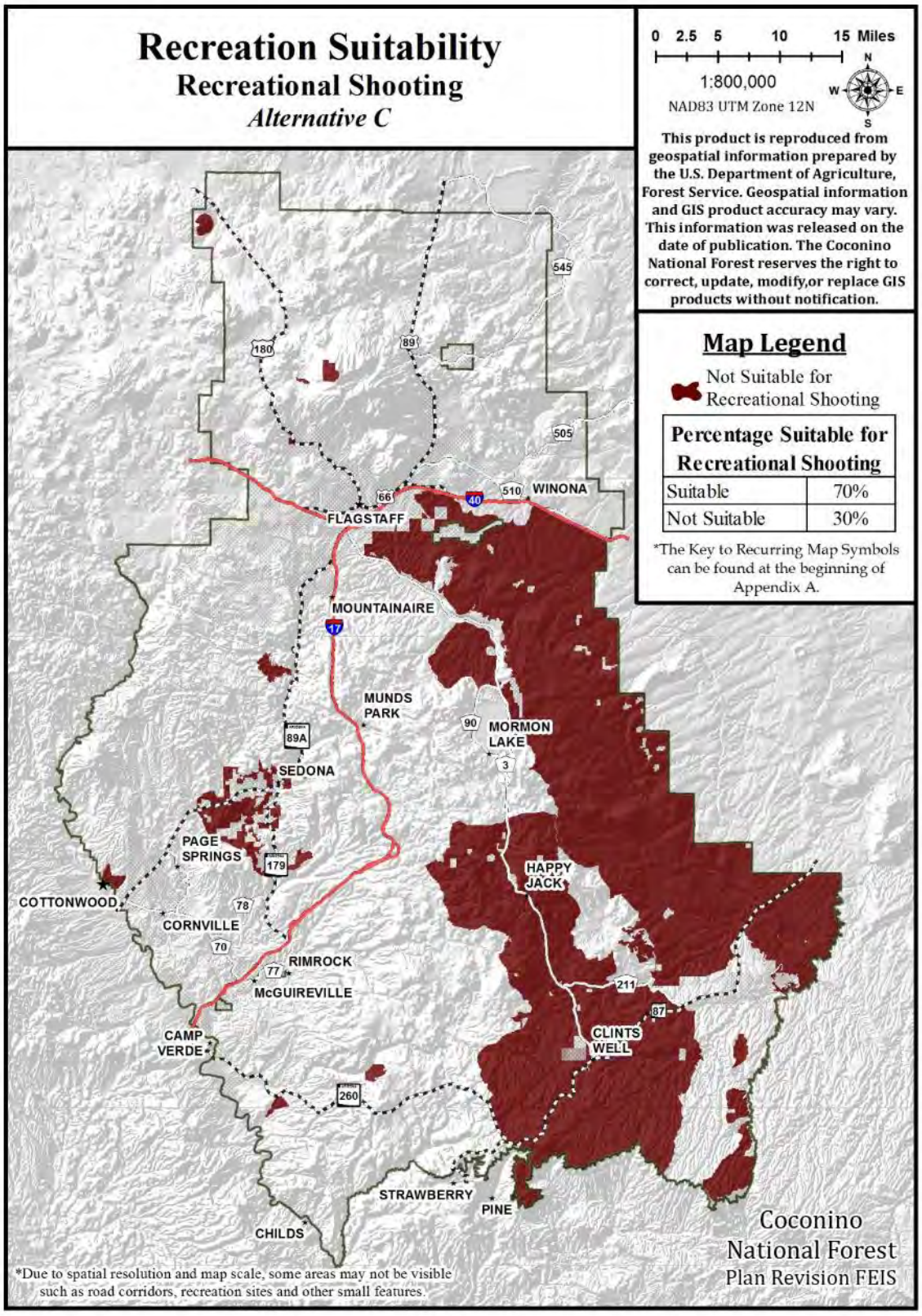
Map 20. Recreation Suitability – Mechanized Travel – Alternative B (modified)


Recreation Suitability
Mechanized Travel
Alternative C
0 2.5 5 10 15 Miles
1:800,000
NAD83 UTM Zone 12N
N
W
E
S
This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the date of publication. The Coconino National Forest reserves the right to correct, update, modify,or replace GIS products without notification.
Map Legend
Not Suitable for Mechanized Travel
Percentage Suitable for Mechanized Travel
Suitable 91%
Not Suitable 1%
*The Key to Recurring Map Symbols can be found at the beginning of Appendix A.
FLAGSTAFF
WINONA
MOUNTAINAIRE
MUNDS PARK
MORMON LAKE
SEDONA
PAGE SPRINGS
HAPPY JACK
COTTONWOOD
CORNVILLE
RIMROCK
McGUIREVILLE
CAMP VERDE
CLINTS WELL
STRAWBERRY
PINE
CHILDS
*Due to spatial resolution and map scale, some areas may not be visible such as road corridors, recreation sites and other small features.
Coconino National Forest
Plan Revision FEIS

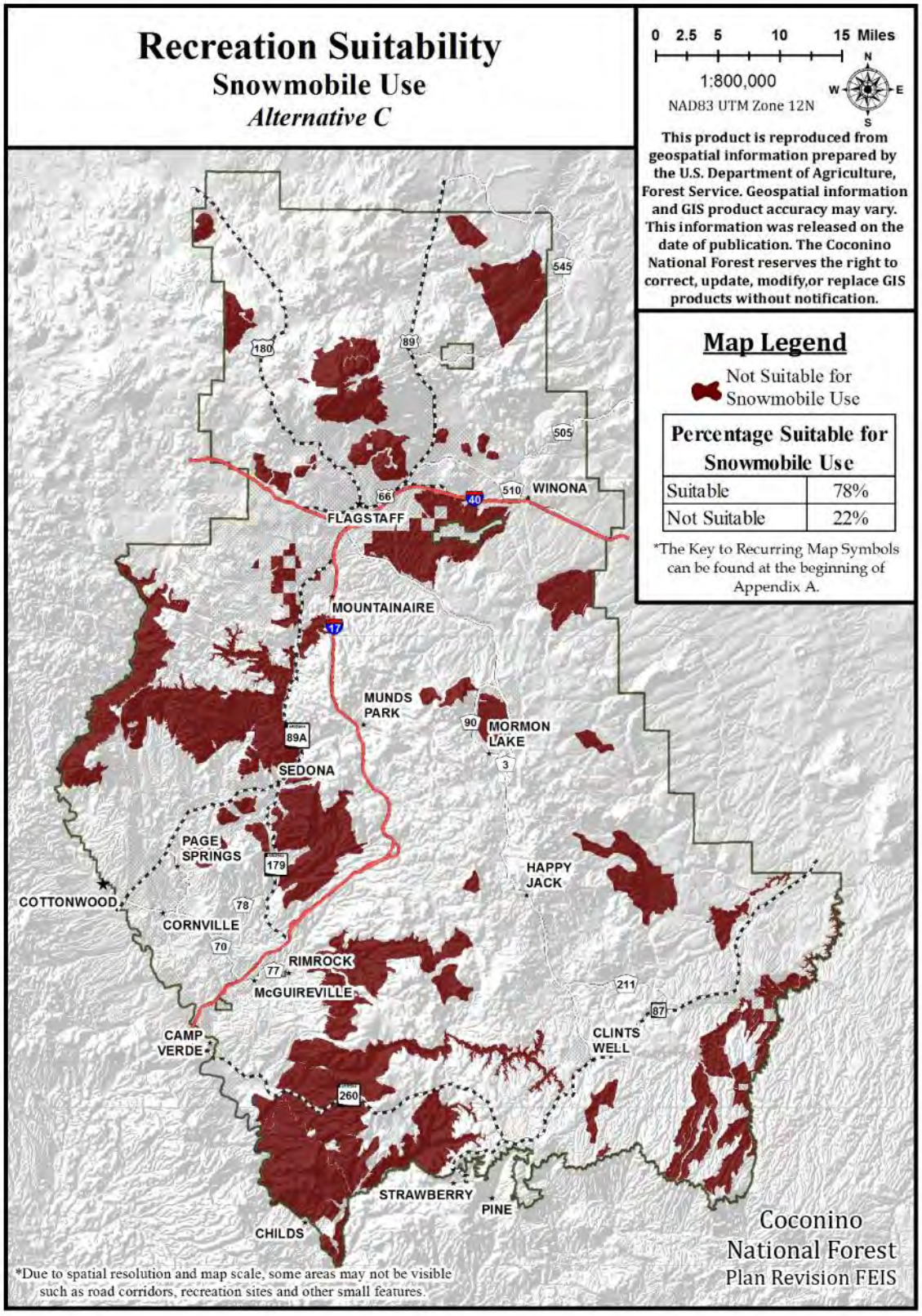
Map 21. Recreation Suitability – Mechanized Travel – Alternative C



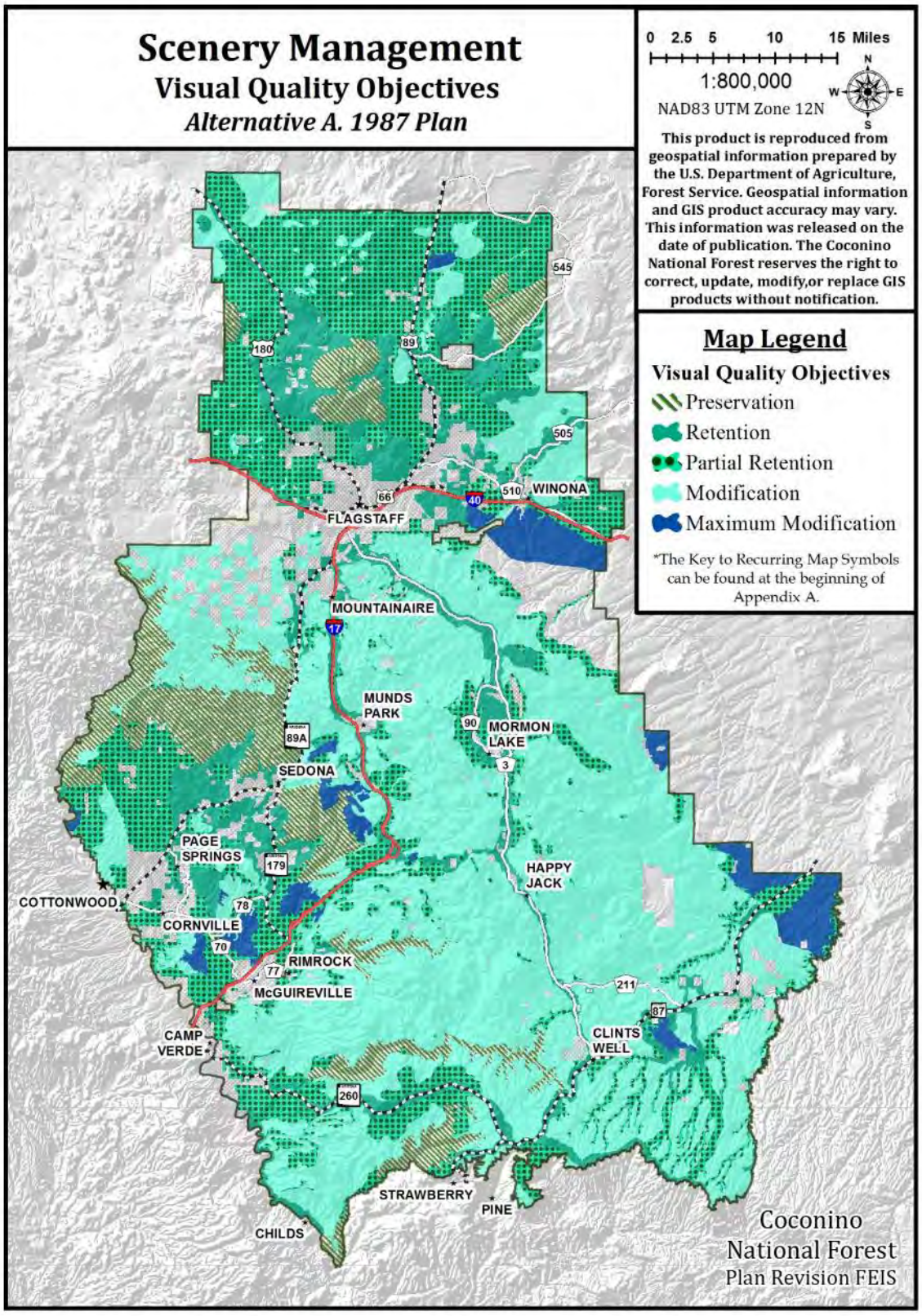
Map 22. Recreation Suitability – Mechanized Travel – Alternative D



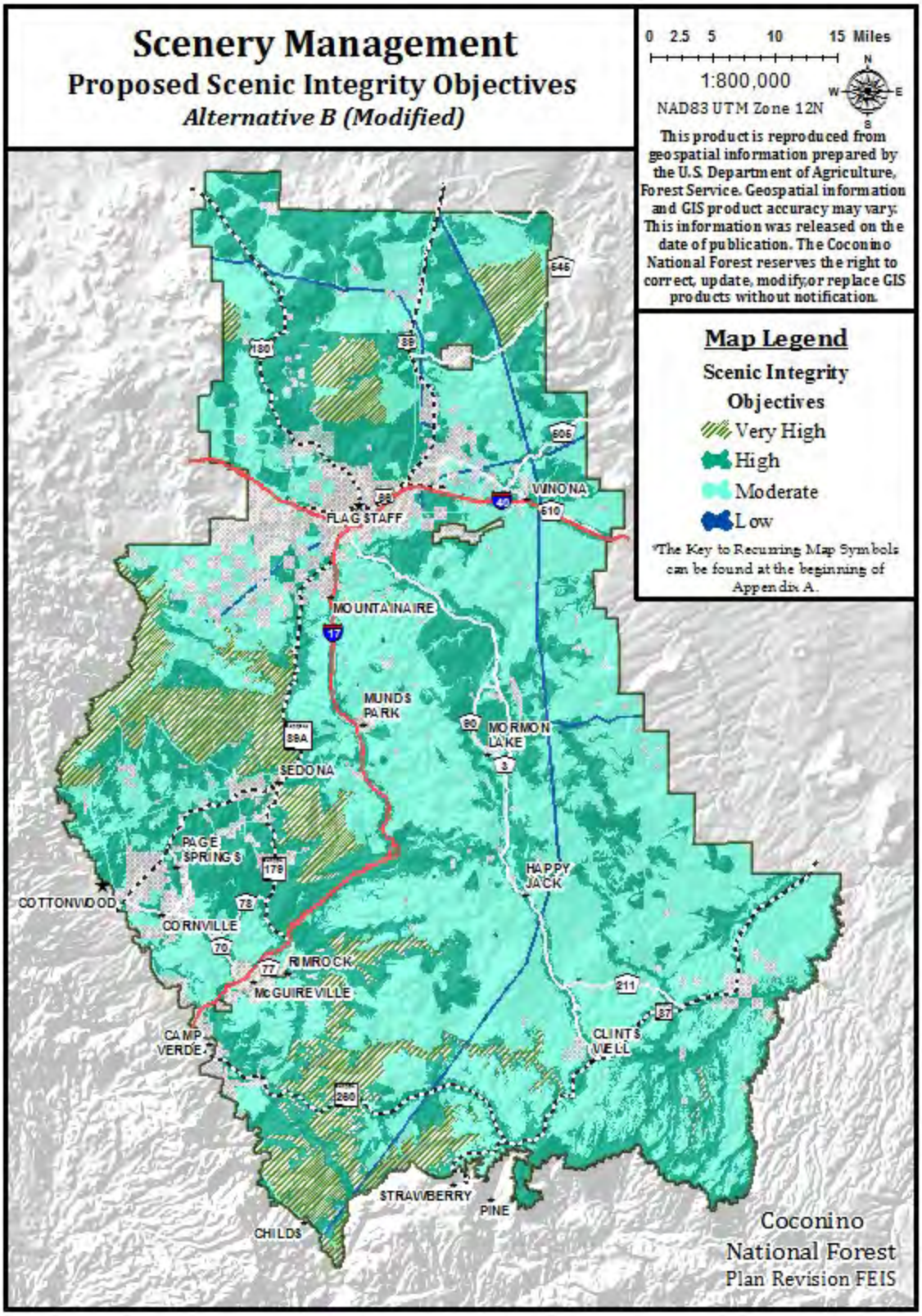
Map 23. Recreation Suitability – Recreational Shooting – Alternative C



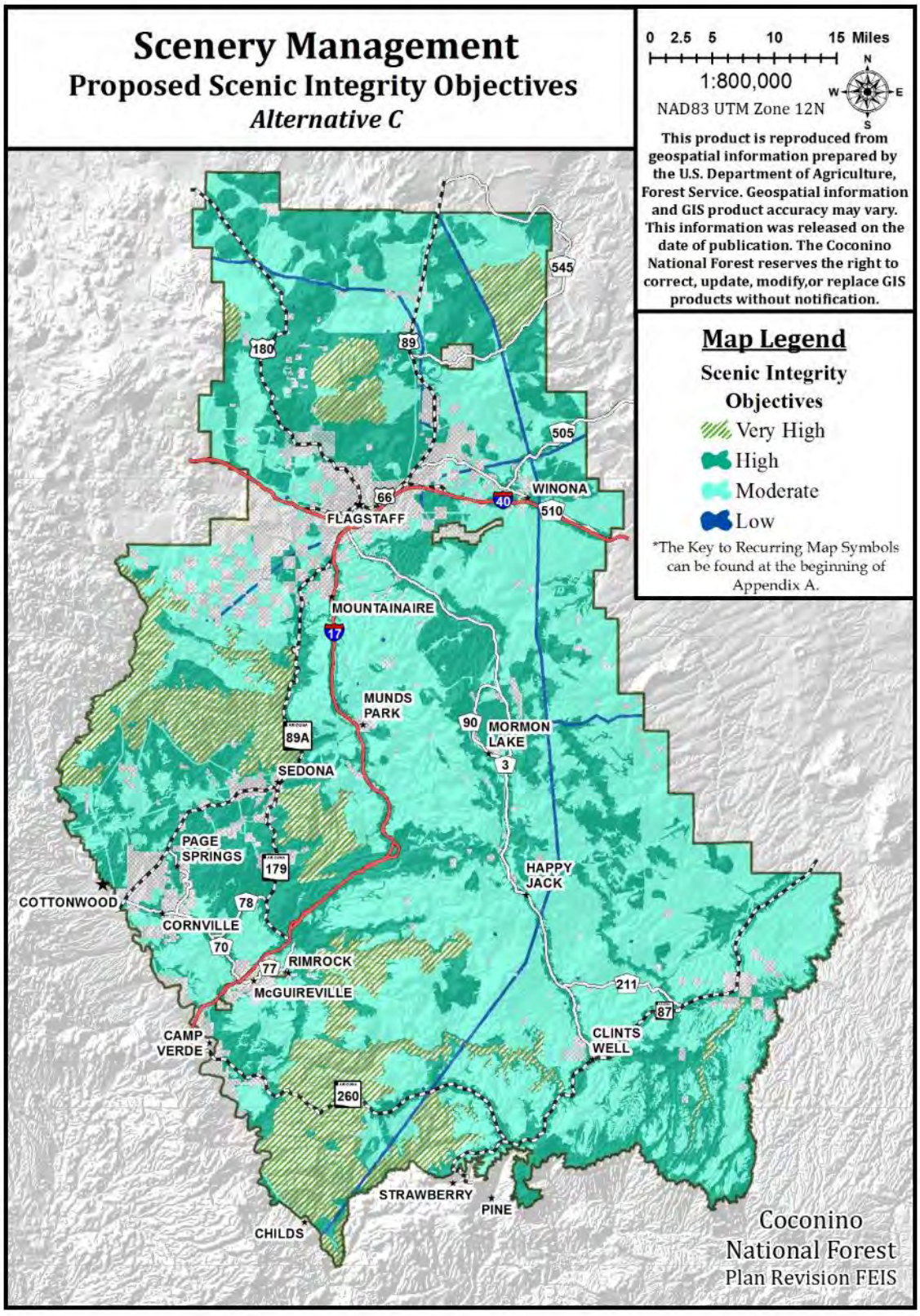
Map 24. Recreation Suitability – Snowmobile Use – Alternative C



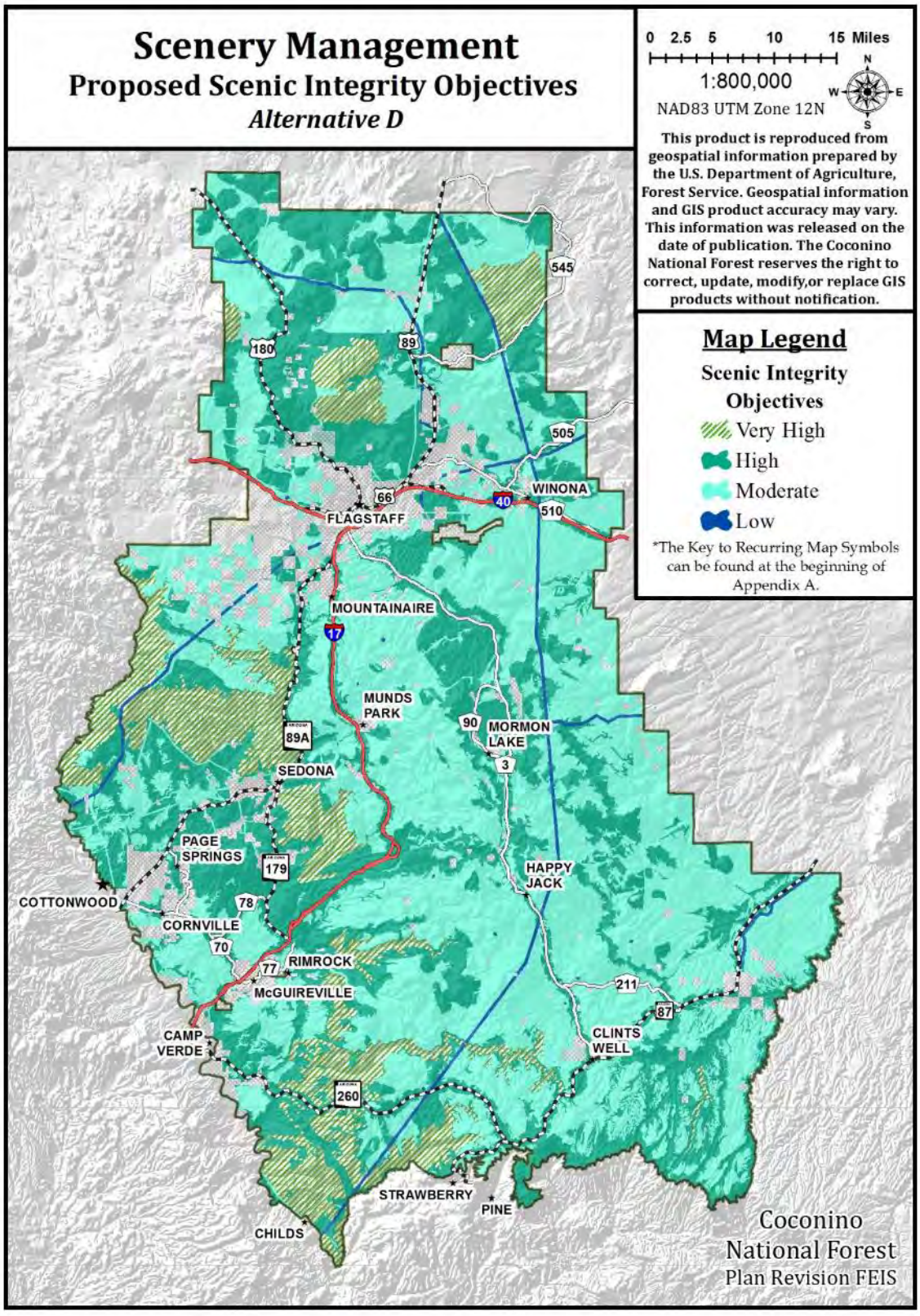
Map 25. Scenery Management – Visual Quality Objectives – Alternative A 1987 Plan



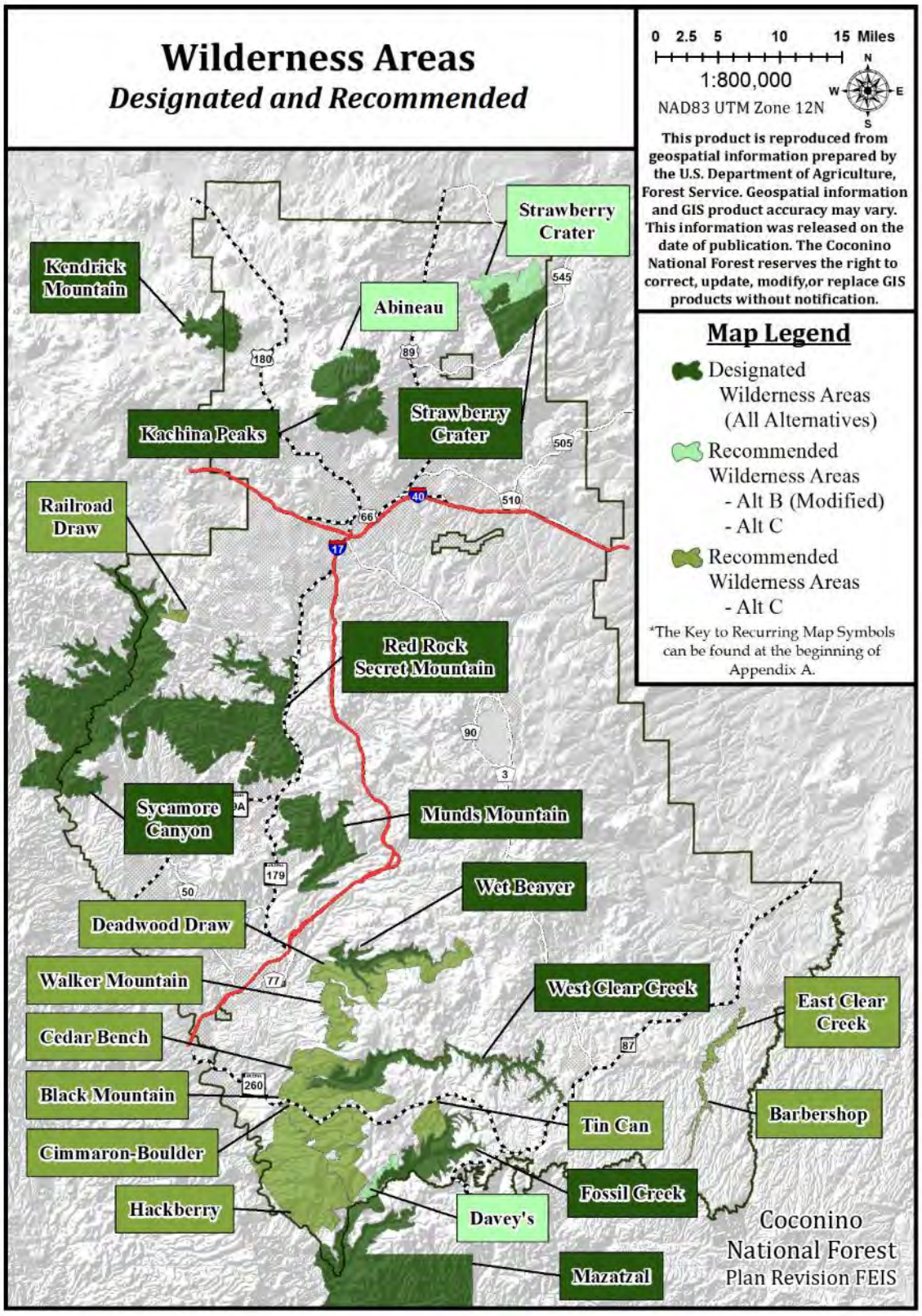
Map 26. Scenery Management – Proposed Scenic Integrity Objectives – Alternative B (modified)



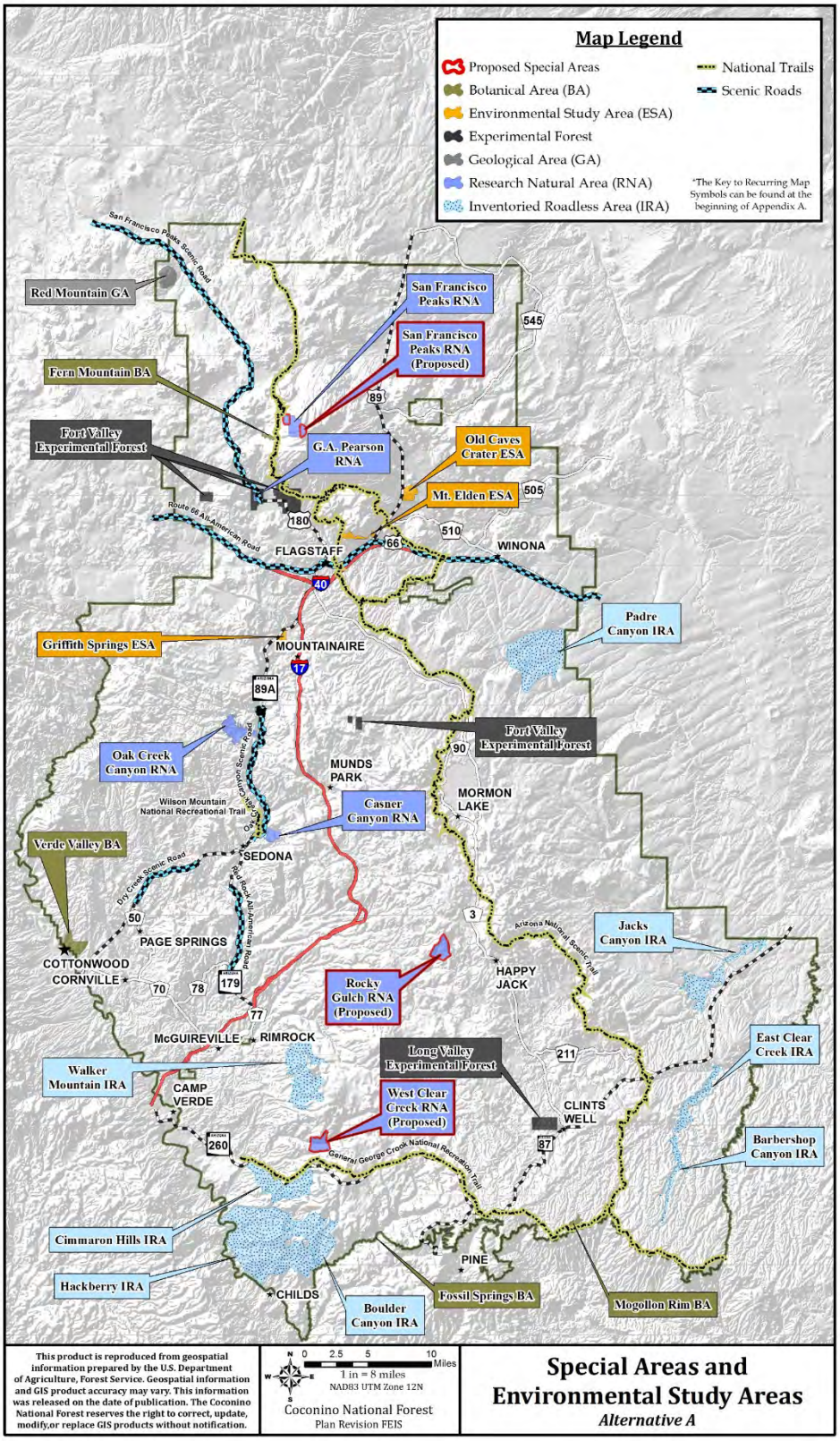
Map 27. Scenery Management – Proposed Scenic Integrity Objectives – Alternative C



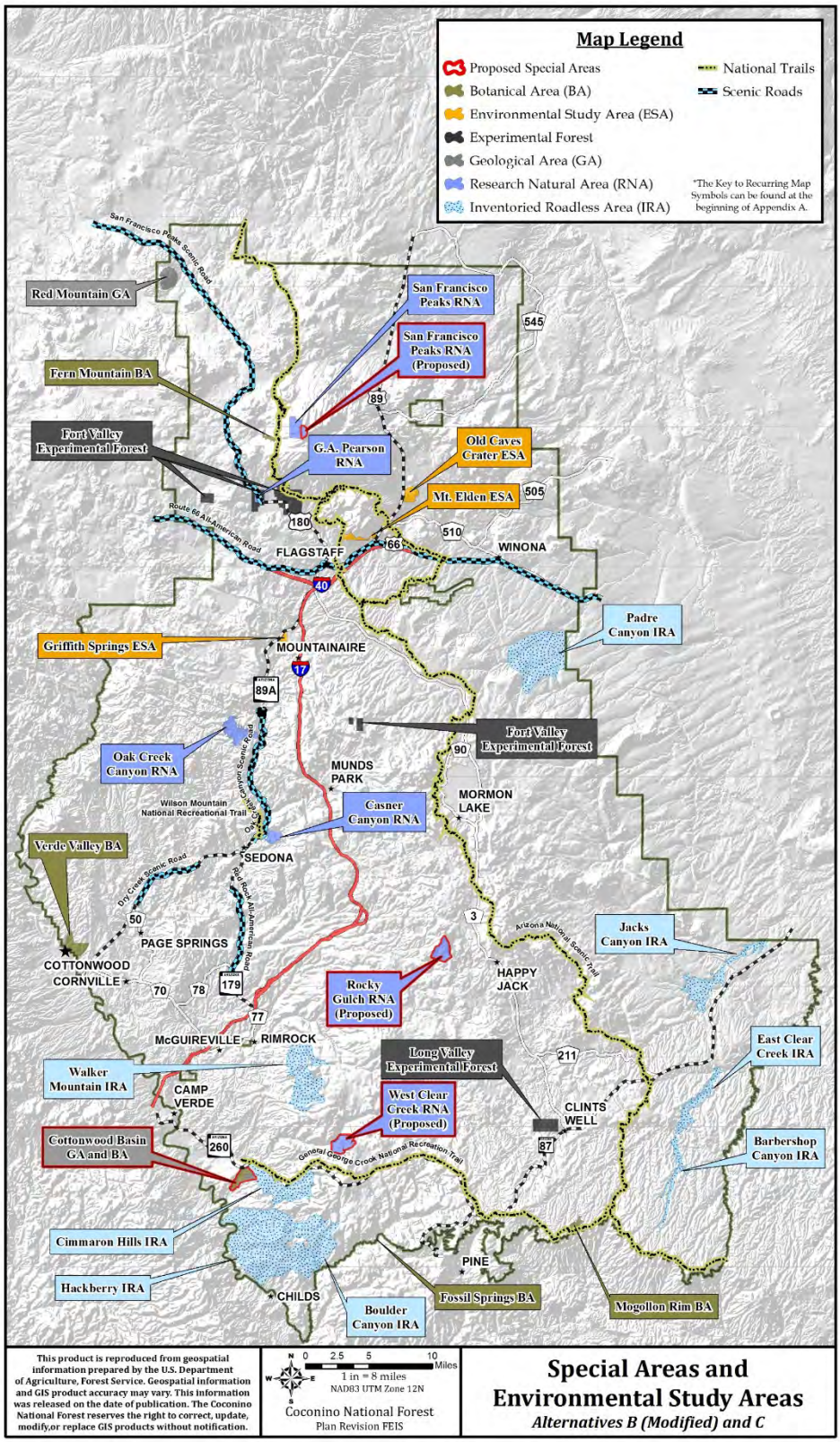
Map 28. Scenery Management – Proposed Scenic Integrity Objectives – Alternative D



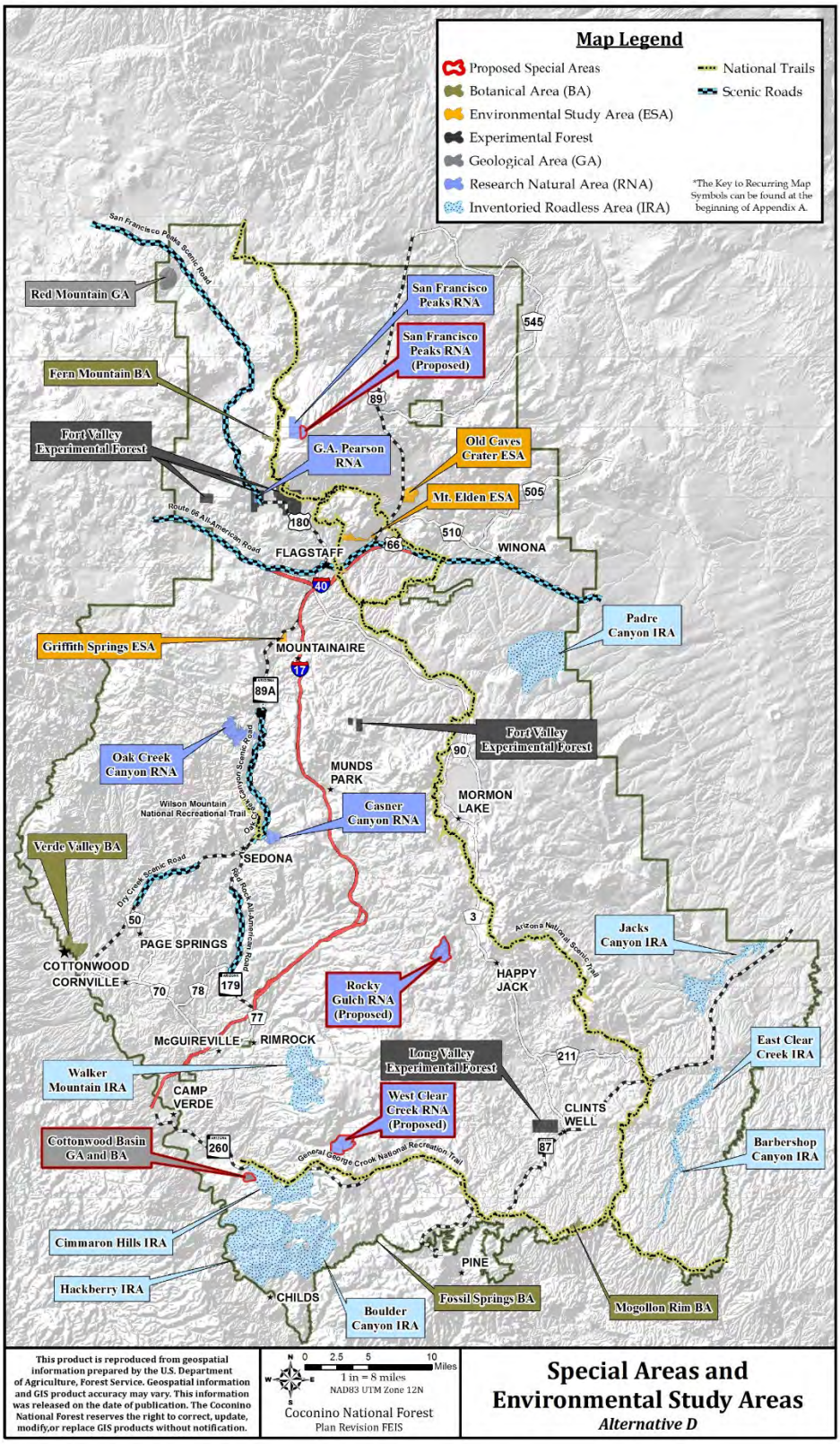
Map 29. Wilderness Areas: Designated and Recommended



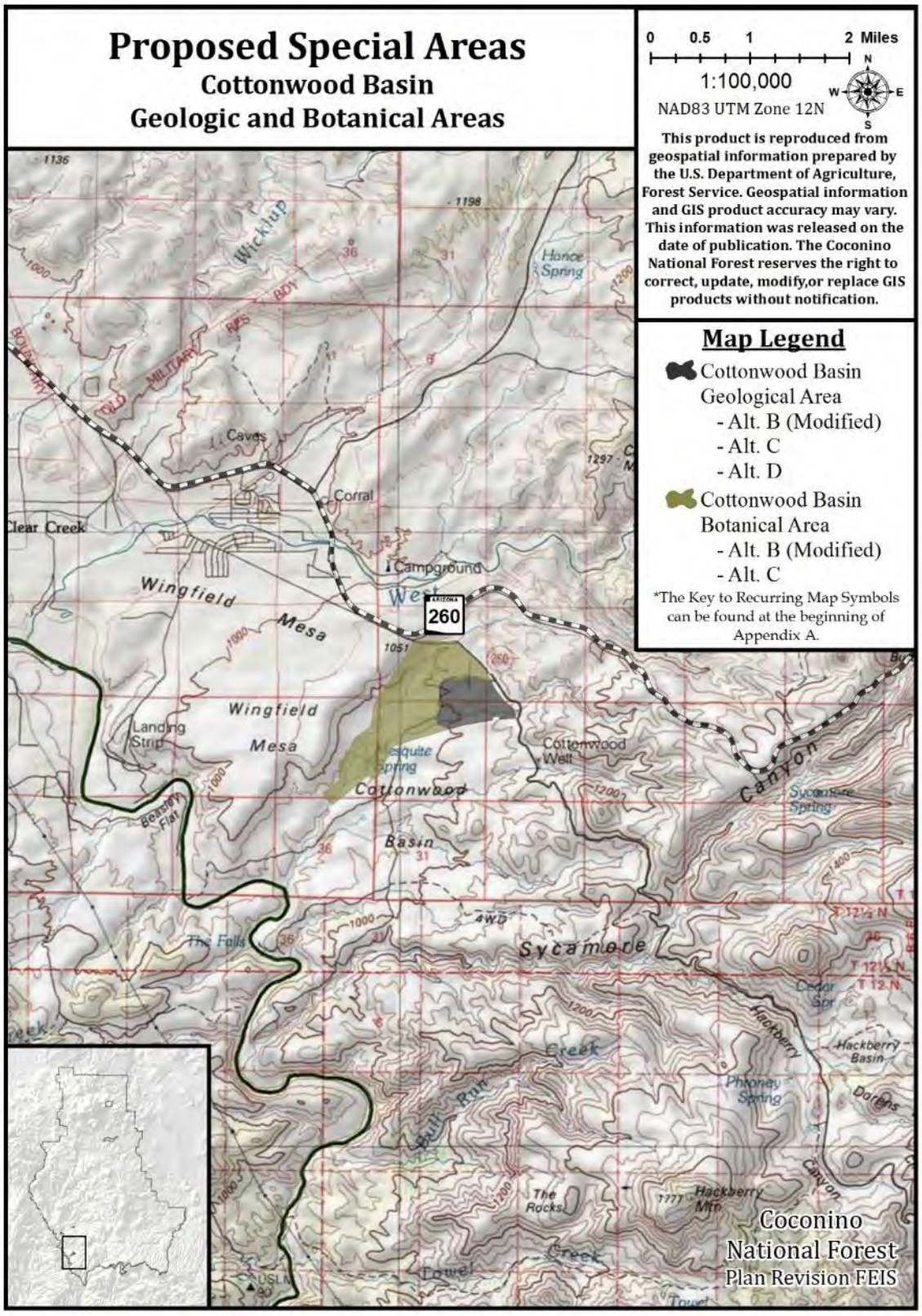
Map 30. Special Areas - Alternative A



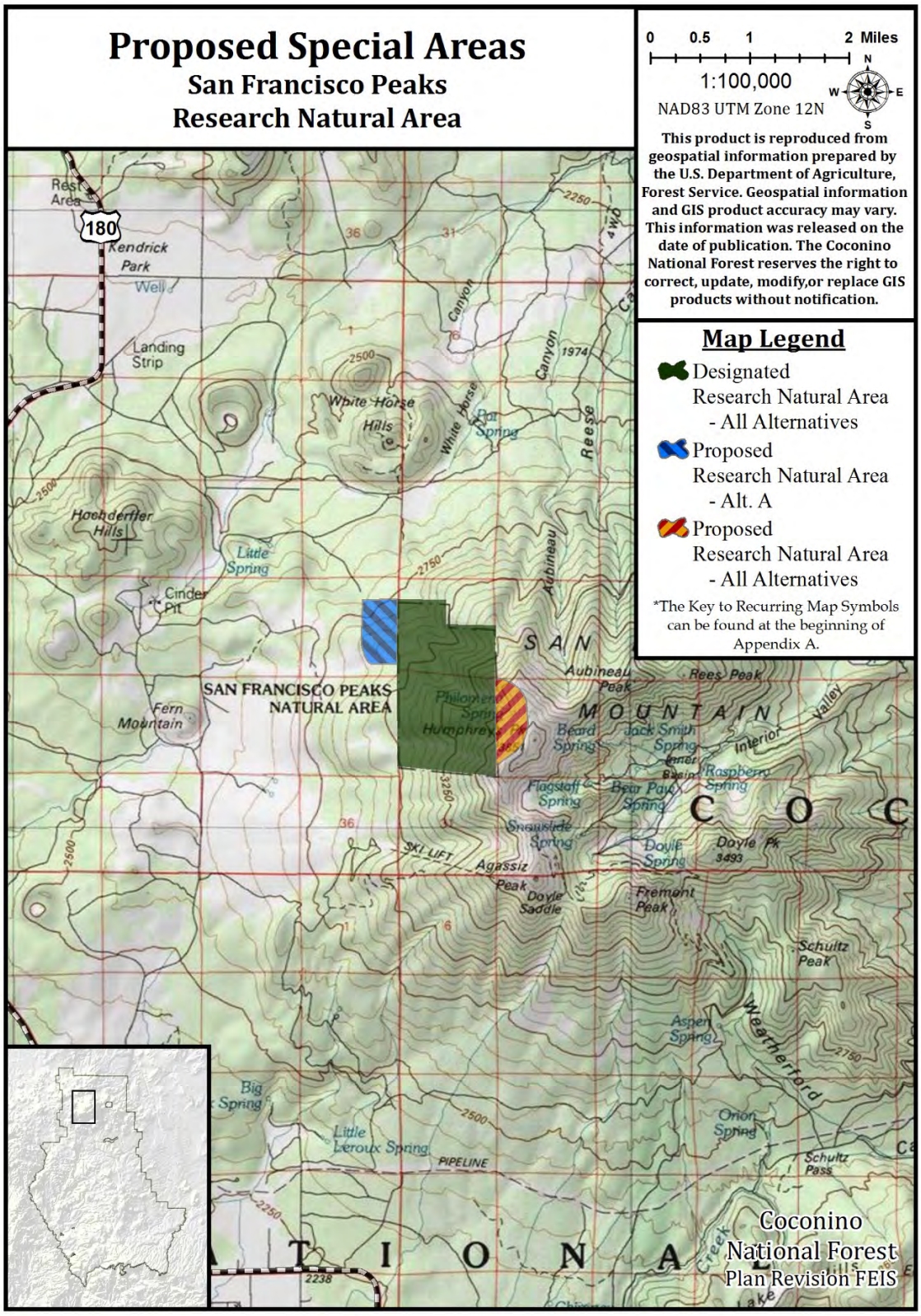
Map 31. Special Areas – Alternatives B (modified) and C



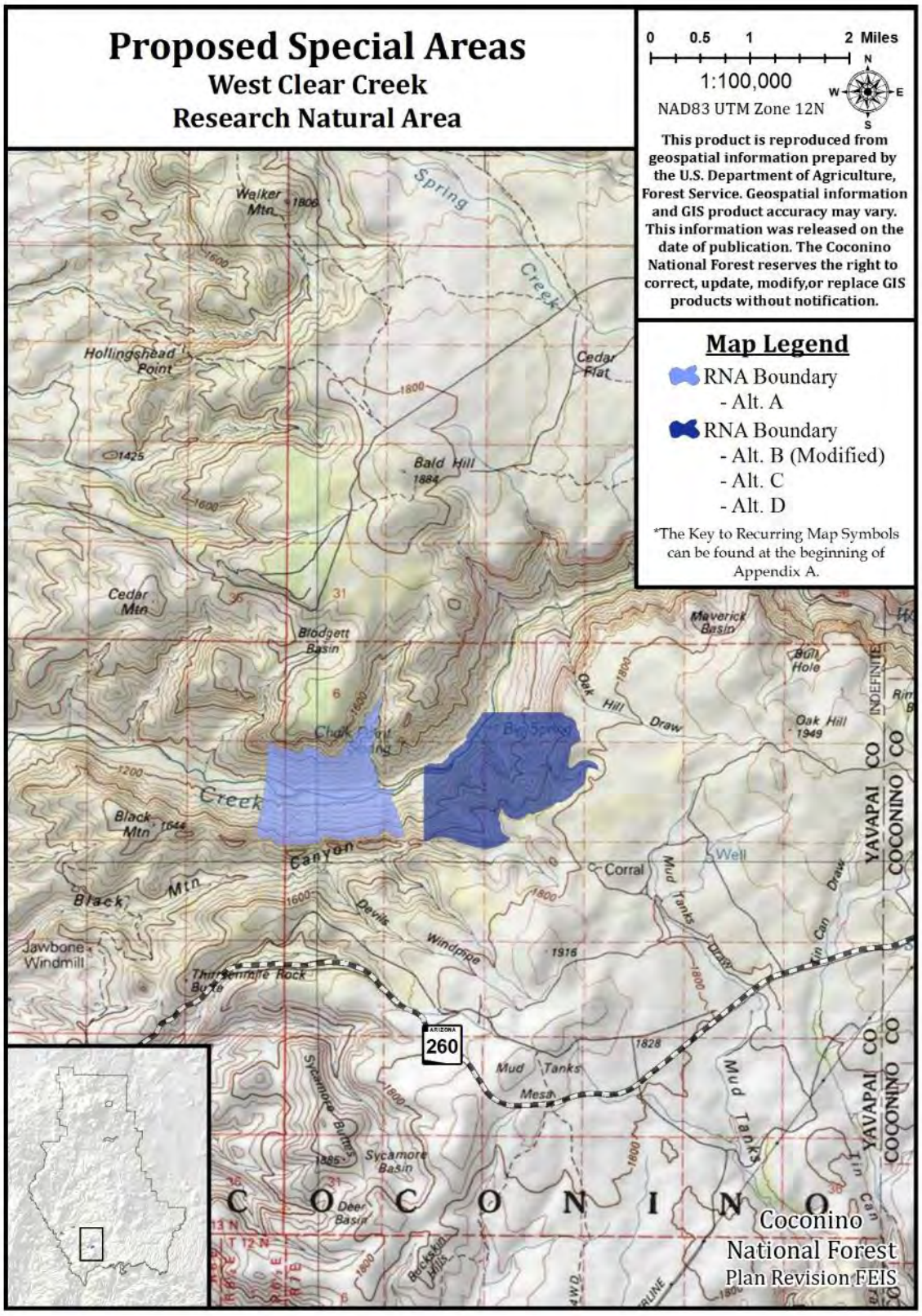
Map 32. Special Areas – Alternative D



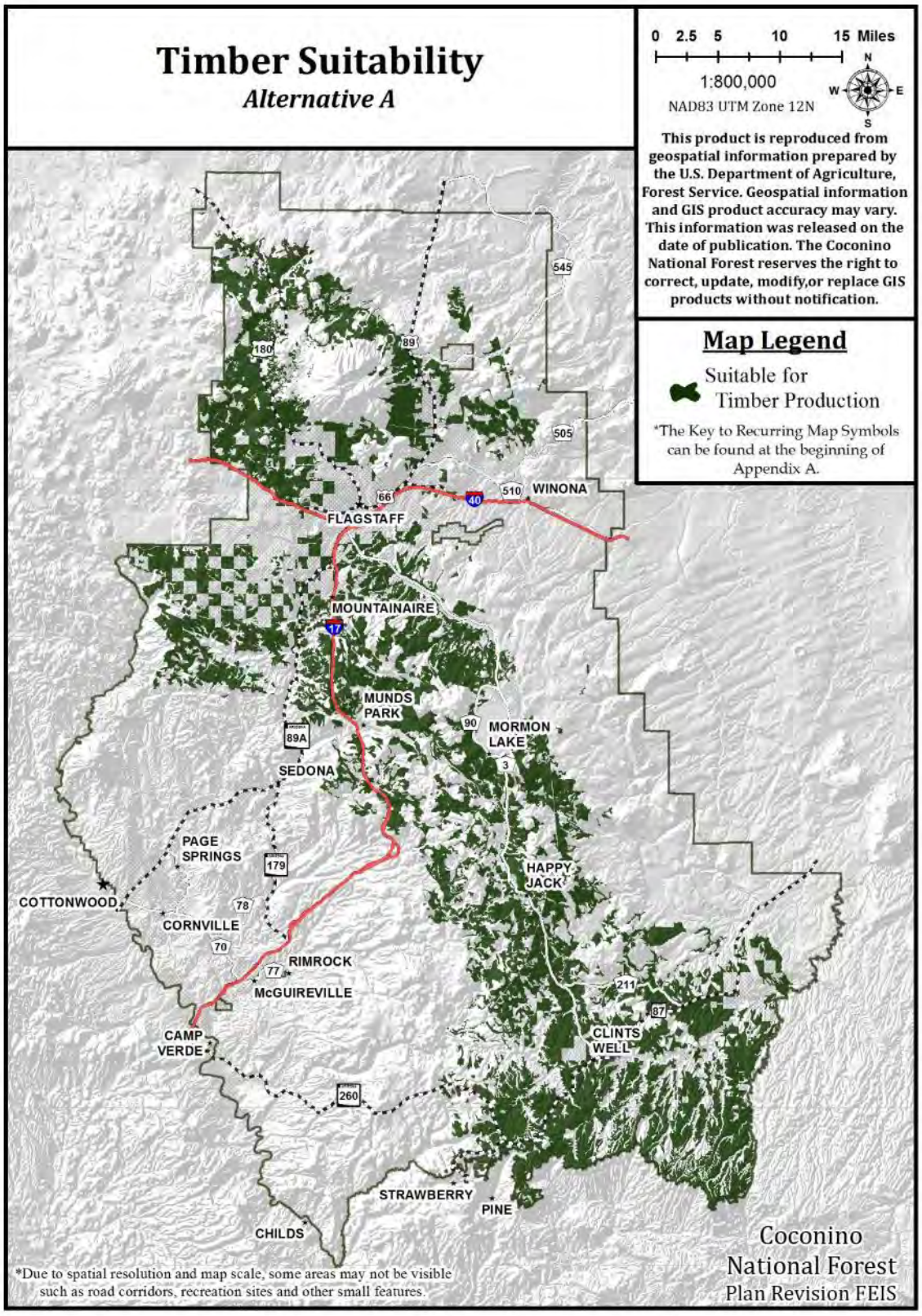
Map 33. Proposed Cottonwood Basin Geologic and Botanical Areas



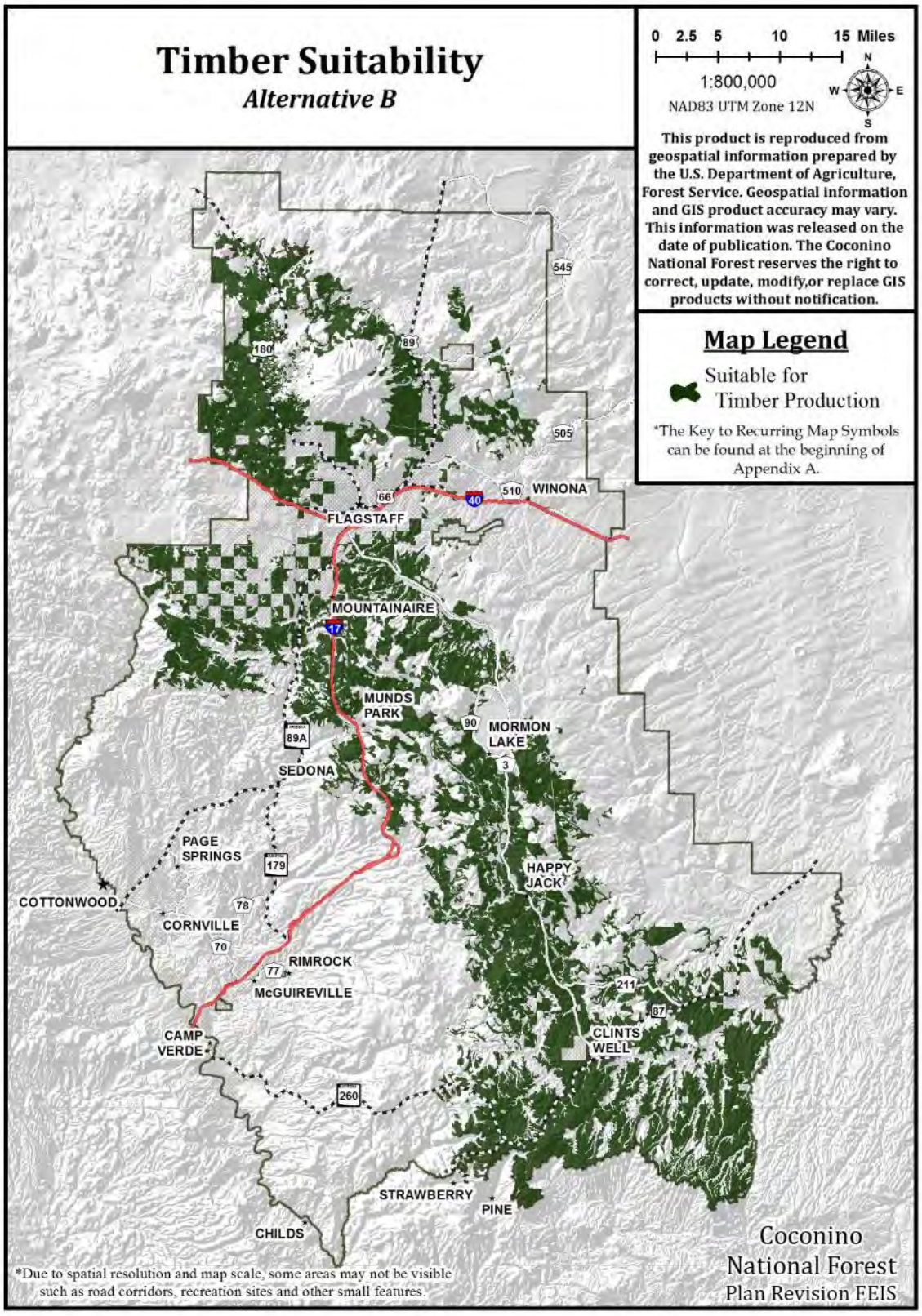
Map 34. Proposed San Francisco Peaks Research Natural Areas



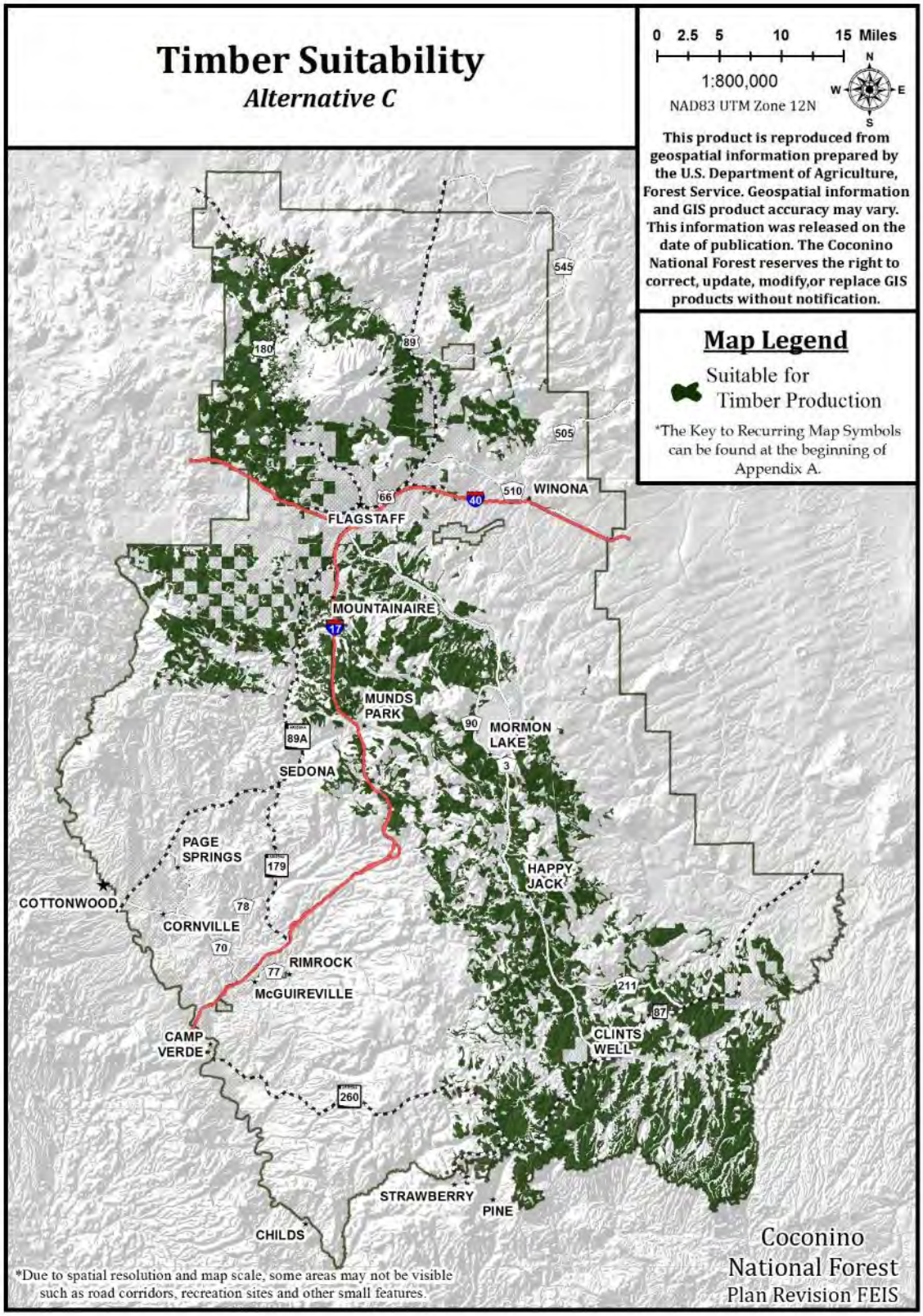
Map 35. Proposed West Clear Creek Research Natural Area



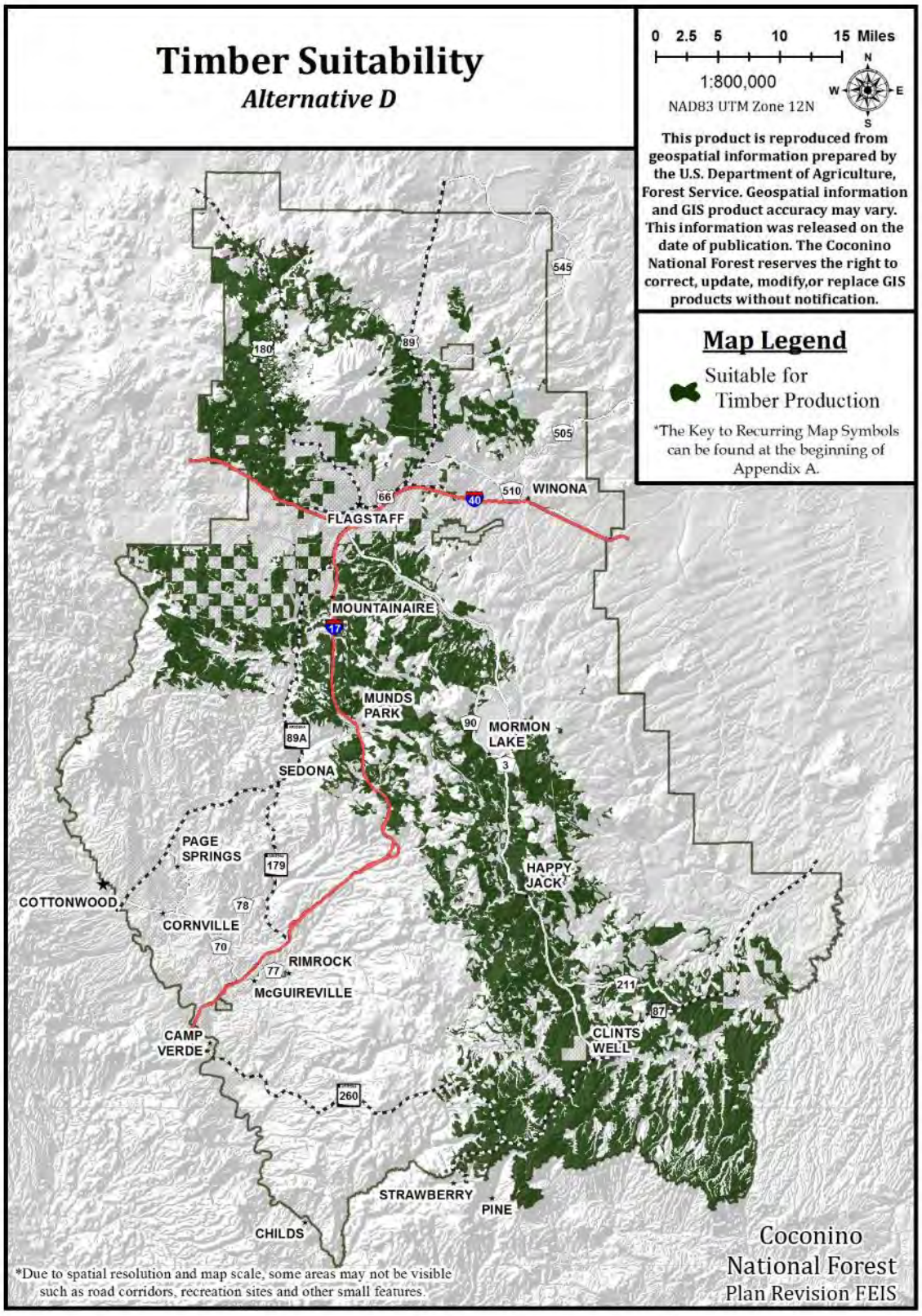
Map 36. Lands Suitable for Timber Production – Alternative A



Map 37. Lands Suitable for Timber Production – Alternative B (modified)



Map 38. Lands Suitable for Timber Production – Alternative C



Map 39. Lands Suitable for Timber Production – Alternative D

Appendix B. Public Collaboration and Coordination with Other Planning Efforts

Introduction

This appendix demonstrates how the Coconino NF integrated the public, stakeholders, and adjacent landowners into the various phases of its land management plan revision effort. The first section of the appendix, "Public Collaboration and Involvement," articulates the ways in which the Coconino NF informed the public and other stakeholders about the development of the plan and invited involvement into the development processes. The second section of this appendix, "Coordination with Other Planning Efforts," briefly discusses the planning and land use policies of adjacent landowners and the ways in which the Coconino NF took those planning efforts into consideration in its own plan revision effort.

Interruptions of the Coconino National Forest Planning Process

When plan development for the Coconino NF started in 2006, the planning team followed direction under the 2005 Planning Rule, which had been finalized by the U.S. Forest Service and published in the Federal Register on December 22, 2004. The following year, on March 30, 2007, the U.S. District Court for the Northern District of California issued an injunction that ordered the Forest Service to discontinue use of the 2005 Planning Rule. The Coconino NF complied with the court order, and further planning activities undertaken were in compliance with laws and rulings not affected by the injunction. Much of the information and public comments gathered prior to the injunction remained useful in the planning effort. Work continued until finalization of the 2008 Planning Rule on April 21, 2008. At that time, plan development began following guidance from the 2008 rule.

A little over a year later, on June 30, 2009, the 2008 Planning Rule was enjoined by the U.S. District Court for the Northern District of California and the development of the Coconino NF plan was again temporarily suspended. The U.S. Department of Agriculture subsequently determined on December 18, 2009, that plans could be amended, revised, or developed using the 2000 Planning Rule as amended, which allowed for use of the 1982 rule provisions. The Coconino NF planning effort moved forward using the 1982 rule provisions and a notice of intent to revise plan was published in the Federal Register on May 12, 2010 (75 FR 26711).

Section I: Public Collaboration and Involvement

Engaging Interested Individuals and Organizations

Informal public involvement occurred prior to the publication of the notice of intent (NOI), starting in mid-2006. Public meetings, information in the Coconino National Forest Annual Stakeholders Report, letters, emails, phone calls, radio announcements, and postings to the Coconino NF website were used to share and gather information and encourage participation in the plan revision process. Plan revision team members also gave presentations, went to the field, and met with individuals and groups. Early in the revision effort, four topic-based workgroups were also formed to focus on special areas and socioeconomic, ecological, and species diversity. Information collected from the public was used to identify the needs for change to the current Forest Plan discussed in the "Analysis of the Management Situation" (AMS) (Forest Service

2010). Topics brought forward by the public and other agencies were then summarized in the AMS and presented to the Coconino NF leadership team. Some of these topics included species diversity, special management areas, livestock grazing, roads and trails, fuel reduction, forest products and industry, water and riparian areas, open space, land exchanges, and places of interest. These needs to change the current Forest Plan, documented in the AMS, were also part of the published Notice of Intent (NOI).

After publication of the NOI, the Coconino NF held two rounds of open house/workshop style public meetings—one round in November 2010 and another in March 2011—to: (1) provide information on the current status of plan revision; (2) present, discuss, and request review of draft language in the proposed plan; (3) receive input regarding whether the proposed plan adequately addressed the needs for change; and (4) identify other issues/concerns which still needed to be addressed. Public meetings were held in Flagstaff, Cottonwood, Happy Jack, and Camp Verde. The plan revision team also held "office hours" at locations in Flagstaff, Happy Jack, and Sedona to allow additional opportunities for the public to discuss the proposed plan with plan revision team members in a more one-on-one setting.

Public input gathered from these meetings, as well as written comments, were used to further refine the proposed plan including: clarifying the important ecological function of old-growth forest and their presence/distribution on the landscape; adding guidelines to reduce road impacts to wildlife and watershed condition, as well as encouraging collaboration with partners to improve habitat connectivity across the landscape; designation of Cottonwood Basin Fumeroles as a geological special area; and the addition of desired conditions to research natural areas (RNAs) to guide grazing management in those areas. Public input that could not be integrated into the proposed plan was used in the development of alternatives to the proposed plan.

After distribution of the Draft Environmental Impact Statement and proposed plan in December 2013, additional public input was gathered during the 90-day comment period on those documents. During the comment period, the Coconino NF hosted a total of 7 public meetings spanning 2 rounds (3 meetings in January 2014, and 4 meetings in February 2014), which were held in Flagstaff, Sedona, and Happy Jack; 20 internal meetings with different resource specialists and district staff; and other meetings requested by the Hopi Tribe, San Carlos Apache Tribe, U.S. Fish and Wildlife Service, Arizona Game and Fish Department, and a handful of local organizations. The purpose of the first round of meetings was to inform participants of the contents of the Draft Environmental Impact Statement and proposed plan and to share tips for reviewing these documents. These meetings were also used as an opportunity to ask participants what topics they wanted additional information on during the following round. Based on their feedback, the focus of the second round of meetings was narrowed to the following topics: dispersed recreation, wildlife and water resources, motorized recreation, wilderness and special areas, and forest uses under permit.

At the conclusion of the 90-day comment period on the Draft Environmental Impact Statement and proposed plan, the Coconino NF had heard from over 1,700 commenters through 100 unique comment letters, which included over 1,100 individual comments. Commenters included: city, county, and State governments; other Federal agencies; the Navajo Nation and White Mountain Apache Tribe; utility companies; various environmental and user-related organizations; and individual citizens. Comments ranged from expressing a preference for a specific plan alternative, to providing alternate analyses, to pointing out typographical errors in the documents. Some of the most common topics included: wilderness recommendations, proposed wildlife habitat

management areas, motorized access, recreational shooting, management areas, climate change, species viability, municipal watershed and water supply, use of reclaimed water, management indicator species, and specific language within the plan components (i.e., desired conditions, objectives, etc.).

Many interactions with the public and other stakeholders were held during the plan revision timeframe (2006 to 2016) throughout the State of Arizona, some of which are included in Table B-1.

Table B-1. Plan revision interactions with the public and other stakeholders during 2006 to 2016

Date	Event	Location
4/13/2006	Meeting with the Grand Canyon Wildlands Council	Flagstaff, AZ
4/19/2006	Meeting with USFWS	Flagstaff, AZ
5/4/2006	Meeting with agencies/public	Flagstaff, AZ
5/12/2006	Meeting with AZGFD	Flagstaff, AZ
6/6/2006	Meeting with Greater Flagstaff Forest Partnership, Community Forest Forum	Flagstaff, AZ
6/8/2006	Meeting with Governor's Oversight Council	Flagstaff, AZ
8/25/2006	Multi-Tribal Meeting (Hopi, Hualapai, Yavapai-Prescott)	Flagstaff, AZ
9/18/2006	Meeting with USFWS and AZGFD	Flagstaff, AZ
9/20/2006	Public meeting	Flagstaff, AZ
10/3/2006	1st round – public meeting	Happy Jack, AZ
10/4/2006	1st round – public meeting	Flagstaff, AZ
10/5/2006	1st round – public meeting	Winslow, AZ
10/7/2006	1st round – public meeting	Phoenix, AZ
10/11/2006	1st round – public meeting	Camp Verde, AZ
10/20/2006	Meeting with species diversity focus groups	Flagstaff, AZ
10/25/2006	Meeting with species diversity focus groups	Flagstaff, AZ
11/1/2006	Multi-Tribal Meeting (Hopi Tribe, Navajo Nation, Hualapai Tribe, Yavapai-Prescott Tribe)	Flagstaff, AZ
11/2/2006	Multi-Tribal Meeting (Hopi Tribe, Navajo Nation, Hualapai Tribe, Yavapai-Prescott Tribe, Pueblo of Acoma)	Flagstaff, AZ
11/13/2006	2nd round – public meeting	Camp Verde, AZ
11/14/2006	2nd round – public meeting	Happy Jack, AZ
11/15/2006	2nd round – public meeting	Flagstaff, AZ
11/16/2006	2nd round – public meeting	Winslow, AZ
11/17/2006	Governments meeting (State, County, City)	Phoenix, AZ
11/17/2006	Governments meeting (State, County, City)	Flagstaff, AZ
11/18/2006	2nd round – public meeting	Phoenix, AZ
11/28/2006	Meeting with species diversity focus groups	Flagstaff, AZ
12/17/2006	Navajo Nation - Cameron Chapter Meeting	Cameron, AZ
1/19/2007	Navajo Nation - Leupp Chapter Meeting	Leupp, AZ
1/31/2007	Navajo Nation - Window Rock Chapter Meeting	Window Rock, AZ
02/06/2007	Meeting with species diversity groups	Flagstaff, AZ

Date	Event	Location
2/13/2007	Public Mtgs. – Greater Flagstaff Forest Partnership	Flagstaff, AZ
2/14/2007	Meeting with ecological diversity focus groups	Flagstaff, AZ
2/16/2007	Navajo Nation - Leupp Chapter Meeting	Leupp, AZ
2/21/2007	Meeting with species diversity groups	Flagstaff, AZ
3/11/2007	Navajo Nation - Tuba City Chapter Meeting	Tuba City, AZ
3/18/2007	Navajo Nation – Cameron Chapter Meeting	Cameron, AZ
3/26/2007	Meeting with species diversity focus groups	Flagstaff, AZ
8/8/2007	Multi-Tribal Meeting (Havasupai, Hopi, Hualapai, Kaibab Paiute, Navajo, Tonto Apache, Yavapai-Apache, Yavapai-Prescott) to discuss Kaibab and Coconino NFs plan revision efforts	Williams, AZ
1/12/2008	Public Meeting	Flagstaff, AZ
3/19/2008	Verde Valley Planners Meeting	Cottonwood, AZ
4/4/2008	FPR Update at annual Wildlife Agencies Coordination Meeting (with USFWS and AZGFD)	Flagstaff, AZ
4/16/2008	Verde Valley Planners Meeting	Cottonwood, AZ
4/29/2008	Presentation at Verde Valley Regional Plan symposium	Cottonwood, AZ
9/17/2008	Verde Valley Planners Meeting	Cottonwood, AZ
1/6/2009	Meeting with Friends of Walnut Canyon	Flagstaff, AZ
2/21/2009	Community Conversation on Sustainability	Flagstaff, AZ
3/31/2009	FPR Update at annual Wildlife Agencies Coordination Meeting (with USFWS and AZGFD)	Flagstaff, AZ
6/27/2009	Meeting with AZ Coalition of Conservation Groups	Flagstaff, AZ
7/16/2009	Attended Rogers Lake Stakeholder Meeting	Flagstaff, AZ
7/22/2009	Participated in Walnut Canyon Study Meeting	Flagstaff, AZ
10/5-8/2009	Participated in Collaborative Conservation in Rapidly Changing Landscapes Conference	Flagstaff, AZ
3/30/2010	FPR Update at annual Wildlife Agencies Coordination Meeting (with USFWS and AZGFD)	Flagstaff, AZ
4/7-8/2010	Participated in Nature Conservancy Climate Adaptation Workshop	Flagstaff, AZ
7/26/2010	Potential Wilderness Public Meeting	Flagstaff, AZ
7/27/2010	Potential Wilderness Public Meeting	Sedona, AZ
8/24/2010	Attended Verde Valley Land Preservation Institute Meeting	Cottonwood, AZ
9/14/2010	Meeting with Hopi, Hualapai, Havasupai, Yavapai-Apache	Flagstaff, AZ
9/15/2010	Meeting with Hopi, Hualapai, Havasupai, Yavapai-Apache	Flagstaff, AZ
10/07/2010	Meeting with Grand Canyon Wildlands Council, Sierra Club, Arizona Wilderness Coalition	Flagstaff, AZ
10/19/2010	Presentation at Village of Oak Creek Community Meeting	Sedona, AZ
11/8/2010	Open House and Public Meeting	Flagstaff, AZ
11/9/2010	Open House and Public Meeting	Cottonwood, AZ
11/10/2010	Open House and Public Meeting	Happy Jack, AZ
12/07/2010	Session in Forest Service Meeting with the Hopi Tribe	Flagstaff, AZ
1/4/2011	Community Conversation on Sustainability Meeting	Flagstaff, AZ

Date	Event	Location
1/14/2011	Participation in Regional Plan Meeting – Green Spaces Inventory	Flagstaff, AZ
1/11/2011	Session in Forest Service Meeting with the Hopi Tribe	Kykotsmovi, AZ
1/21/2011	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
1/27/2011	Meeting with City of Flagstaff, Sustainability and Climate Change	Flagstaff, AZ
2/23/2011	Intertribal Meeting (Havasupai Tribe, Yavapai- Apache Tribe, Yavapai-Prescott Tribe)	Flagstaff, AZ
2/24/2011	"Office Hours" – Public Q&A Session	Flagstaff, AZ
2/25/2011	Attended Diablo Trust Meeting	Flagstaff, AZ
2/26/2011	"Office Hours" – Public Q&A Session	Sedona, AZ
3/1/2011	Public Meetings	Flagstaff, AZ
3/2/2011	Public Meetings	Camp Verde, AZ
3/4/2011	"Office Hours" – Public Q&A Session	Blue Ridge, AZ
3/7/2011	Meeting with Keep Sedona Beautiful	Sedona, AZ
3/8/2011	"Office Hours" – Public Q&A Session	Sedona, AZ
3/14/2011	Presentation to Sierra Club	Flagstaff, AZ
3/30/2011	FPR Update at annual Wildlife Agencies Coordination Meeting (with USFWS and AZGFD)	Beaver Creek Ranger Station
4/6/2011	Meeting with National Park Service	Flagstaff, AZ
4/7/2011	Presentation at Payson Tea Party Meeting	Payson, AZ
5/12/2011	Meeting with Arizona Department of Transportation (ADOT)	Flagstaff, AZ
5/27/2011	Phone call with Grand Canyon Wildlands Council	Flagstaff, AZ
7/14/2011	Participation in City of Flagstaff Community Design Charette	Flagstaff, AZ
10/19/2011	Participation at 4 Agency Partnership Meeting (Bureau of Land Management, ADOT, Federal Highways Administration)	Phoenix, AZ
11/1/2011	Meeting with City of Flagstaff – Highway 180 Winter Traffic Study	Flagstaff, AZ
11/14/2012	Meeting with Conservation Study Forum	Flagstaff, AZ
12/11/2012	Meeting with Keep Sedona Beautiful	Sedona, AZ
8/6/2013	Meeting with USFWS and AZGFD	Flagstaff, AZ
9/18/2013	Presentation at the 12th Annual Biennial Conference of Science and Management on the Colorado Plateau, Northern Arizona University	Flagstaff, AZ
9/21/2013	Booth at Science in the Park as part of the Flagstaff Festival of Science	Flagstaff, AZ
9/25/2013	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
1/14/2014	Public meeting during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Flagstaff, AZ
1/15/2014	Public meeting during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Sedona, AZ
1/16/2014	"Office Hours" – Public Q&A Session during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Blue Ridge, AZ
1/24/2014	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
1/28/2014	Meeting with Dave WIlcox	Flagstaff, AZ
1/31/2014	Phone call with Kim Watson	Flagstaff, AZ

Date	Event	Location
2/6/2014	Meeting with Keep Sedona Beautiful	Sedona, AZ
2/12/2014	Session in Forest Service Meeting with the Hopi Tribe	Kykotsmovi, AZ
2/20/2014	Meeting with Mary Sojourner and Dawn Dyer	Flagstaff, AZ
2/24/2014	Public meeting during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Flagstaff, AZ
2/25/2014	Public meeting during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Sedona, AZ
2/26/2014	"Office Hours" – Public Q&A Session during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Blue Ridge, AZ
2/27/2014	Phone call with staff for Coconino County Commissioner Art Babbott	Flagstaff, AZ
3/1/2014	Public meeting during 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan	Blue Ridge, AZ
3/3/2014	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
3/5/2014	Session in Forest Service Meeting with the San Carlos Apache Tribe	Globe, AZ
3/10/2014	Meeting with Central Arizona Grotto and Northern Arizona Grotto	Flagstaff, AZ
3/11/2014	Meeting with Christa Vojta, Landscape Conservation Initiative at Northern Arizona University	Flagstaff, AZ
3/12/2014	Meeting with Diablo Trust	Flagstaff, AZ
3/13/2014	Presentation and Q&A Session with city council for City of Sedona	Sedona, AZ
4/14/2014	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
7/3/2014	Meeting with Dave Wilcox and Jeanne Trupiano	Flagstaff, AZ
7/22/2014	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
8/12/2014	Meeting with Sierra Club, Center for Biological Diversity, Grand Canyon Wildlands Council	Flagstaff, AZ
8/15/2014	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
9/2/2014	Meeting with Arizona Game and Fish Department	Flagstaff, AZ
9/10/2014	Meeting with Sierra Club, Center for Biological Diversity, Grand Canyon Wildlands Council	Flagstaff, AZ
10/8/2014	Meeting with Keep Sedona Beautiful	Sedona, AZ
11/13/2014	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
3/2/2015	Meeting with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
3/13/2015	Phone call with USFWS and Arizona Game and Fish Department	Flagstaff, AZ
5/28/2015	Meeting with Arizona Snowbowl	Flagstaff, AZ
9/17/2015	Meeting with Arizona Department of Environmental Quality	Flagstaff, AZ
5/18/2016	Phone call Mike Yarborough, Keep Sedona Beautiful	Flagstaff, AZ
5/18/2016	Phone call with Alicyn Gitlin, Sierra Club	Flagstaff, AZ
6/16/2016	Presentation at the Southwestern Regional Forester's Intertribal Consultation and Roundtable	Flagstaff, AZ
6/19/2016	Phone call with Arizona Army National Guard Camp Navajo	Flagstaff, AZ
11/10/2016	Meeting with Arizona Game and Fish Department	Flagstaff, AZ

Media Used in Public Involvement

Beginning in 2006, plan revision information and process updates were periodically emailed and less frequently mailed to individuals and organizations listed and maintained in the Coconino National Forest plan revision ACCESS database, as well as posted on the Coconino National Forest Plan Revision website (http://www.fs.fed.us/r3/coconino/plan-revision.shtml). News releases and public meeting/open house announcements were also shared with the public via email, the Coconino NF Twitter feed, and/or local newspapers. The Coconino NF placed information and meeting notices and announcements in several State and local newspapers: the Arizona Daily Sun (Flagstaff, AZ), Red Rock News (Sedona, AZ), Camp Verde Journal (Camp Verde, AZ), Verde Independent (Cottonwood, AZ), and Camp Verde Bugle (Camp Verde, AZ).

Table B-2 includes some examples of the various types of these communications shared with the public and stakeholders:

Table B-2. Examples of communications shared with the public and stakeholders

Date	Event
8/2006	Announcement of forest plan revision hard copy mailing
9/2006	Notification of 10/2006 and 11/2006 public meeting dates – email and hard copy mailing to tribes, public, and government agencies
11/3/2006	Email announcement of public meetings
11/6/2006	News release via email
11/10/2006	Email announcement that website updated
3/07/2007	Email about opportunity to present special area proposals
7/12/2007	Tribes – Hard copy mailing requesting comments on wilderness recommendations
8/23/2007	Email sharing information about plan revision in light of enjoined 2005 Planning Rule
9/8/2007	Tribes – Hard copy mailing requesting comments/involvement in plan revision
3/28/2008	Revision update via web site and email
5/17/2010	Email notification that notice of intent was published
7/9/2010	Email news release via email and hard copy mailing about public meetings on wilderness
8/2010	Revision update via web site
9/2010	Revision update via web site and email
10/2010	Revision update via web site
11/2010	Revision update via web site, email, and hard copy mailing
11/5/2010	Tribes – hard copy mailing, inviting involvement in public meetings, offering tribal-specific FPR meetings
11/19/2010	Tribes – email to tribes offering individual meetings, sharing FPR web site and info from Nov. public meetings
12/2010	Revision update via web site and email
1/2011	Revision update via web site and email
2/14/2011	Revision update via web site, email, and hard copy mailing
2/25/2011	Email reminder about March 2011 public meetings
3/2011	Revision update via web site, email, and hard copy mailing (included “Potential Wilderness Evaluation Report” information).
4/2011	Revision update via web site and email

Date	Event
5/2011	Revision update via web site, email, and hard copy mailing
9/2011	Revision update via web site and email
11/2012	Revision update via web site and email
9/2013	Revision update via web site and email
12/2013	Announcement of the availability of the Draft Environmental Impact Statement and draft revised plan via web site, email, and hard copy mailing
12/2013	Announcement of public meetings in January and February 2015 via web site, email, and hard copy mailing
2/2014	Reminder about February 2015 public meetings via web site, email, and hard copy mailing
04/2016	Revision update via web site, email, and hard copy mailing
05/2016	Revision update via web site, email, and hard copy mailing
9/2016	Revision update via web site, email, and hard copy mailing

Information Made Available to the Public on the Forest Plan Revision Website

Under the 2008 Planning Rule, two reports were prepared and released to the public: the "Economic and Social Sustainability Assessment" was released in March 2008, and the "Ecological Sustainability Report" was released in May 2010. Although these two reports were developed under the 2008 Rule, the information remained valid and met the requirements for development of the third document used to inform the initial revision process, the "Analysis of the Management Situation," which was developed under the 1982 Rule Provisions and released in 2010.

These reports were made available on the Coconino NF website and in other forms by request. A notice of intent published in the Federal Register on May 12, 2010 (75 FR 26711) announced the availability of these reports, as well as the forest's intent to revise its forest plan based on identified needs for change. Notification of availability of these reports was made with electronic and hard copy mailings, as well as on the Coconino NF website. Comments received on the reports are available for review in the planning record file located at the Coconino NF Supervisor's Office in Flagstaff, Arizona.

A "User's Guide to the Draft Revised Forest Plan" was provided to attendees of the March 2011 public meetings and posted to the Coconino NF website in March 2011, following the public meetings. This document was intended to provide guidance for individuals interested in reading, reviewing, and commenting on the draft revised forest plan. Additionally, several frequently asked questions documents were made available at meetings and electronically to provide more detailed information on the plan revision process, potential wilderness issues, and amendment 12 concerns.

Multiple versions of the draft plan language and accompanying maps/figures/tables (November/December 2010, February/March 2011, December 2013, and May 2016) were made available to public via meetings, mailings, email distribution lists, and the forest plan revision website. Posting of these and other documents to the website began in 2006. In addition to the provision of plan revision team contact information on nearly all documents made available to the

public electronically or at meetings, a link on the plan revision Web page to an electronic comment form has allowed visitors to comment on any document or planning issue at any time.

Other plan development documents throughout the revision process were made available on the Coconino NF website (see Table B-3) http://go.usa.gov/gnzY:

Table B-3. Other plan development documents made available on the Coconino NF website

Analysis of Management Situation and Supporting Documents
Notice of Intent to Revise Coconino NF Forest Plan
Analysis of Management Situation
Ecological Sustainability Report
Economic and Social Sustainability Assessment
Response to Public Feedback on Economic and Social Sustainability Assessment
Wilderness Documents
Potential Wilderness Frequently Asked Questions
Final Potential Wilderness Area Evaluation Report
Final Coconino NF Wilderness Need Evaluation
Final Potential Wilderness Evaluation Inventory and Capability Results
Potential Wilderness Evaluation Process
Response to Feedback
Grazing Guidelines for Wilderness
Grazing Management within Wilderness
Background Documents and Other Information
1987 Coconino NF Forest Plan
Values, Attitudes, and Beliefs Toward National Forest System Lands: Arizona Tribal Peoples
Values, Attitudes, and Beliefs Toward National Forest System Lands: The Coconino National Forest
Evaluating the Economic Contribution of the National Forests of Arizona: Supplement to the 2005 Socioeconomic Assessments
Socioeconomic Assessment for the Coconino National Forest
Arizona National Forest Socioeconomic Assessments Manager's Summary Report
Annotated Bibliography for Arizona National Forest Socioeconomic Assessments
Region 3 Planning Web Site
NFMA Plan Model
NFMA Planning Directives

Tribal Government Consultation

Thirteen federally recognized tribes have ties to the Coconino NF:

Fort McDowell Yavapai Nation
Hopi Tribe
Hualapai Tribe
Havasupai Tribe
Navajo Nation
Pueblo of Acoma
Pueblo of Zuni
San Carlos Apache Tribe
San Juan Southern Paiute Tribe
Tonto Apache Tribe
Yavapai –Apache Nation
Yavapai–Prescott Tribe
White Mountain Apache Tribe

The Coconino NF first notified all of the above tribes of forest plan revision in September 2006, with a letter announcing the start of the revision process and the dates for the first round of public meetings. Information sharing has continued throughout the plan revision process, both in written correspondence and face-to-face meetings. The plan revision team has sent written communications to the tribes and has held several plan revision sessions and meetings specifically for tribal government and tribal members. Many of the forest plan revision-related tribal events and communications that occurred during the revision timeframe (2006 to 2016) are included in Table B-4 below:

Table B-4. Plan revision-related tribal events and communications during 2006 to 2016

Date	Tribal Event or Communication	Location
8/25/2006	Multi-Tribal Meeting (Hopi, Hualapai, Yavapai-Prescott)	Flagstaff, AZ
9/8/2006	Hard copy mailing - notification of start of forest plan revision process, announcement of public meeting dates for first round of meetings, offer of individual FPR meetings	
11/1/2006	Multi-Tribal Meeting (Hopi Tribe, Navajo Nation, Hualapai Tribe, Yavapai-Prescott Tribe)	Flagstaff
11/2/2006	Multi-Tribal Meeting (Hopi Tribe, Navajo Nation, Hualapai Tribe, Yavapai-Prescott Tribe, Pueblo of Acoma)	Flagstaff
12/17/2006	Navajo Nation - Cameron Chapter Meeting	Cameron, AZ
1/19/2007	Navajo Nation - Leupp Chapter Meeting	Leupp, AZ
1/31/2007	Navajo Nation - Window Rock Chapter Meeting	Window Rock, AZ
2/16/2007	Navajo Nation - Leupp Chapter Meeting	Leupp, AZ
3/11/2007	Navajo Nation - Tuba City Chapter Meeting	Tuba City, AZ
3/18/2007	Navajo Nation – Cameron Chapter Meeting	Cameron, AZ
7/12/2007	Hard copy mailing - requesting comments on Wilderness recommendations	
8/8/2007	Multi-Tribal Meeting (Havasupai, Hopi, Hualapai, Kaibab Paiute, Navajo, Tonto Apache, Yavapai-Apache, Yavapai-Prescott) to discuss Kaibab and Coconino NFs plan revision efforts)	Williams, AZ
9/8/2007	Hard copy mailing, requesting involvement and comments on plan revision	
9/14-15/2010	Meeting with Hopi, Hualapai, Havasupai, Yavapai-Apache	Flagstaff, AZ

Date	Tribal Event or Communication	Location
11/5/2010	Hard copy mailing, inviting involvement in public meetings, offering tribal-specific FPR meetings	
11/19/2010	Email to tribes offering individual meetings, sharing FPR web site and info from Nov. public meetings	
12/07/2010	Session in Forest Service Meeting with the Hopi Tribe	Flagstaff, AZ
1/11/2011	Session in Forest Service Meeting with the Hopi Tribe	Kykotsmovi, AZ
2/23/2011	Intertribal Meeting (Havasupai Tribe, Yavapai- Apache Tribe)	Flagstaff, AZ
12/12/2013	Hard copy mailing, inviting review and comment of Draft Revised Land Management Plan and Draft Environmental Impact Statement, offering tribal-specific FPR meetings	
12/31/2013	Hard copy mailing, inviting involvement in public meetings, offering tribal-specific FPR meetings	
1/16/2014	Hard copy mailing to Navajo Nation Chapter Houses, offering tribal-specific FPR meetings	
2/12/2014	Session in Forest Service Meeting with the Hopi Tribe	Kykotsmovi, AZ
3/5/2014	Session in Forest Service Meeting with the San Carlos Apache Tribe	Globe, AZ
4/12/2016	Hard copy mailing, inviting review of Draft Revised Land Management Plan, offering tribal-specific FPR meetings	
6/16/2016	Presentation at the Southwestern Regional Forester's Intertribal Consultation and Roundtable	Flagstaff, AZ

Federal, State, County, and Local Agency Coordination and Assistance

This section lists the Federal, State, county, and local agencies that participated or assisted in the development of the draft plan since the initiation of plan development. No Federal agency requested cooperating agency status during the preparation of this environmental impact statement.

Government agencies that participated in plan development

Federal

U.S. Department of Agriculture

Apache-Sitgreaves National Forests
Kaibab National Forest
Prescott National Forest
Tonto National Forest
Rocky Mountain Research Station
Southwestern Regional Office
Natural Resources Conservation Service

U.S. Department of Defense – Army Corps of Engineers

U.S. Department of Energy

U.S. Department of the Interior

Bureau of Land Management
Bureau of Indian Affairs
Bureau of Reclamation
Fish and Wildlife Service
National Park Service

U.S. Department of Transportation – Federal Highway Administration

U.S. Environmental Protection Agency

U.S. Federal Energy Regulatory Commission

U.S. Senators

The Honorable John McCain
The Honorable Jon Kyl
The Honorable Jeff Flake

U.S. Representatives

The Honorable Paul Gosar
The Honorable Ben Quayle
The Honorable Trent Franks
The Honorable Gabrielle Gifford
The Honorable Ann Kirkpatrick

State

Arizona Department of Environmental Quality
Arizona Game and Fish Department
Arizona Department of Mines and Minerals
Arizona Department of State Lands
Arizona Department of Transportation
Arizona Department of Water Resources
Arizona State Forestry Division
Arizona State Parks
Arizona Geological Survey
Office of the Governor
Arizona State Senators
Arizona State Representatives
Northern Arizona Council of Governments
Northern Arizona University
Arizona State University
University of Arizona

- Coconino County Cooperative Extension

- Yavapai County Cooperative Extension

County

Coconino County
Yavapai County
Gila County

Local

City of Flagstaff
City of Sedona
City of Winslow
City of Phoenix
Town of Camp Verde
Town of Clarkdale
Town of Cottonwood
Town of Payson
Village of Oak Creek
Beaver Creek Communities – Lake Montezuma, McGuireville, Rimrock
Camp Navajo
Cornville
Happy Jack/Long Valley/Clint's Well
Munds Park
Page Springs
Pine
Strawberry
Winona

Section II: Coordination with Other Planning Efforts

Introduction

Provisions of the 1982 Planning Rule state that the responsible line officer shall review the planning and land use policies of other Federal agencies, State and local agencies and governments, and American Indian tribes. In preparing the Coconino NF's proposed revised plan, the planning team reviewed the objectives expressed in the plans, assessments, and strategies of adjacent stakeholders and agencies and evaluated the interrelationships. A summary of each of these plans, assessments, and strategies is included below. For the most part, the Coconino NF proposed revised plan complements these other planning efforts. These plans, assessments, and strategies were considered in the development of plan components to ensure as much alignment as was practicable. Management approach sections of the proposed revised plan highlight identified issues and remind forest managers of opportunities for coordinating with various partners across administrative boundaries, particularly State, local, tribal, and Federal agencies. The primary similarities are in managing for safe and healthy vegetation conditions, protection of air and water quality, providing for quality core wildlife habitats with connectivity, and maintenance of high scenic values. Cross-boundary issues include managing for wide-ranging species and wildfire across agency boundaries, and working together to improve efficiency. While there were some differences related to the differing missions, no conflicts requiring alternative development were identified.

The Chief of the Forest Service, Tom Tidwell, has called for an "all-lands approach" to land management, which involves adjacent stakeholders and Federal agencies, State agencies, local governments, and American Indian tribes working together across boundaries to determine common goals for the landscapes they share. In order to facilitate this "all-lands approach," it is important to understand the goals and anticipated activities of our adjacent land owners. The following sections provide a summary of those goals and activities.

American Indian Tribes

Thirteen tribal groups within Arizona have connections with the Coconino NF: the Fort McDowell Yavapai Nation, Hopi Tribe, Hualapai Tribe, Havasupai Tribe, Navajo Nation, Pueblo of Acoma, Pueblo of Zuni, San Carlos Apache Tribe, San Juan Southern Paiute Tribe, Tonto-Apache Tribe, Yavapai-Apache Nation, Yavapai-Prescott Indian Tribe, and White Mountain Apache Tribe.

The following tribes have resource-related plans that are relevant to the Coconino NF.

Hopi Tribe

The "**Hopi Woodland Management Plan**" is an integrated resource management plan for the 197,098 acres of pinyon juniper woodlands on the Hopi Reservation (Hopi Tribe 2006). The primary objective: protection of woodland spiritual and cultural values while providing tribal members with the opportunity to harvest subsistence amounts of firewood and fencing material. Other objectives include protection and provision of traditionally used resources; wildlife habitat; watersheds; threatened, endangered, and culturally sensitive species; prevention of noxious weed invasion; protection and restoration of riparian areas; and promotion of pinyon nut harvest.

Hualapai Tribe

The overall goal of the Haulapai Department of Natural Resources is to produce long-term, sustainable, balanced, multiple use of natural resources under the direction of the Hualapai Tribal Council.

The Hualapai Fire Management Plan includes goals to: (1) protect human safety and property while managing timber and range resources sustainably; (2) maintain adequate air and water quality; and (3) reduce the likelihood of catastrophic fire (Hualapai Department of Natural Resources 2002).

The Watershed Management Plans for Eight Sub-Basins of the Hualapai Reservation includes identification of nonpoint source pollution sources and associated mitigation actions to improve water quality in the Colorado River and within the Truxton Wash and the Upper Gila watersheds (Hualapai Department of Natural Resources 2007). The tribe is actively managing endangered native fish and an active elk hunting program.

Federal Agencies

Department of the Interior – National Park Service

The Coconino NF is adjacent to or near six national monuments: Walnut Canyon, Sunset Crater Volcano, Wupatki, Montezuma Castle, Montezuma Well, and Tuzigoot. The areas in which these national monuments are found include varied elevation and vegetation types, from remote and undeveloped zones of desert and mountain ranges, to urban interface zones near Flagstaff, Cottonwood, Camp Verde, and other communities. These lands sustain a wide range of activities and resources.

General Management Plans (GMP) exist for each national monument. The decisions in the each GMP only apply to the USDI-administered lands within the boundaries of the respective national monument. These plans focus on desired conditions, monitoring, and adaptive management with mutually common goals of promoting native vegetative communities and ecological processes and managing access. These goals should help to provide healthy habitat for wildlife and sustainable, resilient ecosystems over the greater landscape.

The Walnut Canyon Study is a joint initiative of the U.S. Forest Service and National Park Service to explore management options for an area of land surrounding Walnut Canyon National Monument, primarily administered by the Coconino National Forest. The Coconino County Board of Supervisors and city of Flagstaff City Council supported additional protection of lands surrounding the monument and requested Federal authorization for a special resources and land management study for purposes of determining how best to protect these lands from future development. On March 30, 2009, President Barack Obama signed into law the Omnibus Public Land Management Act of 2009 (the act) as passed by the United States Congress. The act includes language directing the Secretary of Agriculture and the Secretary of the Interior to conduct a special study on management options for an area within the Flagstaff Ranger District of the Coconino NF and surrounding Walnut Canyon National Monument (managed by the NPS).

The objectives for the study regarding management of the Walnut Canyon Study Area are to assess each of the following potential land management designations:

- The suitability and feasibility of designating all or part of the study area as an addition to Walnut Canyon National Monument (to be managed by the NPS), in accordance with section 8(c) of Public Law 91-383 (16 U.S.C. 1a-5(c));
- Continued management of the study area by the Forest Service; or
- Any other designation or management option that would provide for protection of resources within the study area; and continued access to, and use of, the study area by the public.

The Walnut Canyon Special Study was completed in 2014 (National Park Service 2014) and has been transmitted to the Secretary of Agriculture. The study presents three viable management options to the Secretary, including:

- Continuation of current management by the U.S. Forest Service;
- Congressional action establishing a special designation to the Study Area; and
- Congressional action that prohibits the exchange of Federal lands to other than Federal land management agencies.

Federal Highway Administration – Office of Federal Lands Highway

The role of the Federal Highway Administration (FHWA) is to ensure that America's roads and highways are safe and technologically up-to-date. Although most highways are owned by State, local, and tribal governments, FHWA provides financial and technical support. The Office of Federal Lands Highway (FLH) funding provides dollars for roads and highways within federally owned lands, such as national forests. In addition to funding, FLH provides planning, design, and engineering services to support the highways and bridges that provide access to and are within federally owned lands (Federal Highway Administration 2016).

National Guard Bureau/Arizona Army National Guard – Camp Navajo: Integrated Resource Management Plan

As stewards of public lands, the National Guard Bureau (NGB) and Arizona Army National Guard (AZARNG) are charged with protecting the existing natural and cultural features of Camp Navajo. **"Camp Navajo's Draft Integrated Resource Management Plan"** is currently under review (Arizona Army National Guard Camp Navajo 2015). The draft plan has many goals related to natural resource management, including: restoration of forest resiliency and function by moving toward re-establishment of historic forest, structure, pattern, and composition, restoration of fire to its natural role in the ecosystem, protection of vegetation communities, and management of wildlife habitat.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) administers the Endangered Species Act (ESA). Section 7 (1)(1) of the ESA directs Federal agencies to aid in conservation of listed species and section 7 (1)(2) requires that agencies, through consultation with the FWS, ensure that their activities are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitat. As projects and activities are planned, forest managers consult with the FWS (Fish and Wildlife Service 2016). The FWS issues national polices to promote the conservation and recovery of listed species, including species recovery plans.

In 2005, the Southwestern Region of the Forest Service (Arizona and New Mexico) prepared a regionwide amendment related to the management of northern goshawk and Mexican spotted owl habitat and old-growth standards and guidelines. This amendment applied to all forest plans in the Region that were completed in the 1980s. A biological opinion on this amendment was subsequently completed by the FWS. In May 2010, the Southwestern Region (Arizona and New Mexico) re-initiated consultation on the 2005 regionwide amendment. A Forest Service biological assessment was submitted to the FWS in April 2011. The FWS completed its biological opinion for the Coconino National Forest on March 30, 2012, and released the "Mexican Spotted Owl Recovery Plan, First Revision" in September 2012 (FWS 2012).

In September 2010, the FWS released its strategic response to climate change, "Rising to the Urgent Challenge: *Strategic Plan for Responding to Accelerating Climate Change"* (FWS 2010). This strategic response includes goals to work with partners to develop a national fisheries and wildlife adaptation

strategy and to engage partners in collaborative conservation in which solutions to the impacts of climate change are sought.

In May 2011, the FWS released "A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats" (FWS 2011). This plan provides a coordinated national management strategy for investigating the cause of white-nose syndrome and finding a means to prevent the spread of the disease.

U.S. Forest Service

The Coconino NF coordinated with its neighboring national forests also undergoing plan revision, working to edge-match maps, and coordinate management direction across forest boundaries. In addition, the Coconino NF is one of the four forests involved in the landscape-scale Four Forest Restoration Initiative (4FRI) and, as such, the Coconino NF collaborated with the Kaibab, Apache-Sitgreaves, and Tonto NFs to coordinate its plan revision with the planning of that initiative to ensure that restoration activities would be compatible with the guidance and desired conditions of the proposed plan.

Apache-Sitgreaves National Forests

The Apache-Sitgreaves National Forests (Apache-Sitgreaves NFs) is broken into five separate ranger districts, with the westernmost ranger district, Black Mesa, bordering the Coconino NF. The Apache-Sitgreaves NFs completed the revision of their forest plan in August 2015. This final revised plan was used to determine interactions between guidance found in the Coconino NF's proposed plan. No conflicts were found in the Apache-Sitgreaves NFs' final revised plan.

Kaibab National Forest

The Kaibab National Forest (Kaibab NF) is broken into three separate ranger districts. They are found both north and south of Grand Canyon National Park and near Williams, Arizona. The southernmost district is the Williams Ranger District which shares a boundary with the Coconino NF east and north of Williams, Arizona. The Kaibab NF completed the revision of its forest plan in February 2014. This final revised plan was used to determine interactions between guidance found in the Coconino NF's proposed plan. No conflicts were found in the Kaibab NF's final revised plan.

Prescott National Forest

The Prescott National Forest (Prescott NF) is broken into three separate ranger districts that surround Prescott, Arizona. The Chino Valley and Verde Ranger Districts share a boundary with the Coconino NF. The Prescott NF completed the revision of its forest plan in June 2015. This final revised plan was used to determine interactions between guidance found in the Coconino NF's proposed plan. No conflicts were found in the Prescott NF's final revised plan.

Four Forest Restoration Initiative (4FRI)

The Coconino, Kaibab, Apache-Sitgreaves, and Tonto NFs are actively engaged in a collaborative, landscape-scale initiative designed to restore fire-adapted ecosystems in the Southwestern Region. Together with a diverse group of stakeholders, the four forests are working to collaboratively plan and carry out landscape-scale restoration of ponderosa pine forests in northern Arizona. The overall goal of the 4FRI is to create landscape-scale restoration approaches that will provide for fuels reduction, forest health, and wildlife and plant diversity at no cost to the government. The selected alternative for the first 4FRI environmental impact statement and the proposed action for the Rim Country project were used to determine interactions between guidance found in the Coconino NF's proposed plan. No conflicts were found in the selected alternative for the first 4FRI environmental impact statement or the proposed action for the Rim Country project.

State

Arizona Department of Agriculture

The Arizona Department of Agriculture is the State's regulatory agency for agriculture, including animals, plants, and environmental services. Title 3 of the Arizona Revised Statutes contains the provisions related to agricultural topics such as dangerous plant pests and diseases, pesticides, brands and marks, and seizure of livestock. Their mission is to regulate and support Arizona agriculture in a manner that encourages farming, ranching, and agribusiness while protecting consumers and natural resources. (Arizona Department of Agriculture 2016)

Arizona Department of Environmental Quality

The mission of the Arizona Department of Environmental Quality (ADEQ) is to protect and enhance public health, welfare, and the environment in Arizona. ADEQ serves as the State's environmental regulatory agency in the areas of air and water quality and waste programs. Forest management activities strive to be in compliance with the applicable Arizona Revised Statutes, particularly Title 49 which outlines specifics such as water quality standards and total maximum daily loads (Arizona Department of Environmental Quality 2016).

Arizona Department of Transportation

The Arizona Department of Transportation (ADOT) is responsible for planning, building, and operating the Arizona State highway system.

Corridor Management Plans: A corridor management plan (CMP) is a community planning document that looks at entire scenic and/or historic routes and inventories and documents the special qualities, characteristics, features, and resources of that byway. The document is a planning effort outlining a vision/blueprint for corridor improvements, complete with suggestions to enhance the natural views/scenery. The plan regulates only the land within the ADOT right-of-way.

Several existing and pending CMPs cover routes that are within the boundaries of, and/or adjacent to, the Coconino NF. Some of these routes include, but are not limited to, the Sedona-Oak Creek Canyon Scenic Road (State Route 89A from milepost 375.5 to milepost 390.0), San Francisco Peaks Scenic Road (US Highway l80 from milepost 226 to milepost 255), Red Rock Scenic Road (State Route 179 from milepost 302.5 to milepost 310.0), and Historic Route 66.

"Arizona's Long-Range Transportation Plan": ADOT completed an update of their long-range plan in November 2011. (Arizona Department of Transportation 2011). The plan includes the following goals and objectives: improve mobility and accessibility, link transportation and land use, support economic development, promote natural, cultural, and environmental resources, and strengthen partnerships.

"The State Transportation Improvement Program (FY 2016 – 2020)" identifies statewide priorities for transportation projects. It is a compilation of projects utilizing various Federal funding programs and includes highway projects on the city, county, and state highway systems, as well as projects in the national parks, U.S. Forest Service, and Indian Reservation roads. (Arizona Department of Transportation 2015).This is a 4-year project list compiled in cooperation with the Federal Highway Administration, Federal Transit Administration, Council of Governments, and the Metropolitan Planning Organizations (MPOs). Projects are selected for inclusion in the State Transportation Improvement Program (STIP) based on adopted procedures and criteria

"The Five-Year Transportation Facilities Construction Program (2017-2021)" sets forth a plan for developing projects and accounts for spending funds for the next 5 years. All projects in the first 2 years

of the program will be fully funded and ready to advertise within the year programmed, or sooner, as determined by the State Transportation Board. The last 3 years of the program will be illustrative in nature and used to establish an implementation plan for projects moving through the various development phases needed prior to the construction of the project. The program includes the following sections: Highways Program, Maricopa Association of Governments Regional Transportation Plan Freeway Program, Pima Association of Governments Regional Transportation Plan Freeway Program, and Airport Development Program (Arizona Department of Transportation 2016).

Arizona Department of Water Resources

The mission of the Arizona Department of Water Resources (ADWR) is to secure long-term dependable water supplies for Arizona. ADWR administers and enforces the State's groundwater code and surface water rights laws. (Arizona Department of Water Resources 2016). Title 45 of the Arizona Revised Statutes contains the provisions related to water and groundwater resources.

Arizona Game and Fish Department

The ***"Wildlife 20/20 Strategic Plan"*** provides management direction for the department's program of work. The plan is built around two strategic themes: wildlife conservation and recreation (Arizona Game and Fish Department 2016). The plan is intended to be a living document that will be reviewed no less than every three years.

"The Arizona State Wildlife Action Plan: 2012-2022" (previously titled "Arizona's Comprehensive Wildlife Conservation Strategy"), was approved in 2012, and provides the vision for managing Arizona's fish, wildlife, and wildlife habitats. The plan contains several key elements that may provide information for, or have an impact on, Coconino NF management:

- distribution and abundance of wildlife;
- locations and condition of key habitats and community types;
- problems that may adversely affect species in their habitats;
- proposed conservation actions for habitats and species and implementation priorities;
- proposed monitoring plans for: species, effectiveness of conservation actions, adapting conservation actions;
- procedures to review the Arizona State Wildlife Action Plan;
- plans to coordinate with Federal, State, and local agencies and Indian tribes on the plan; and
- broad public participation (Arizona Game and Fish Department 2012).

"The Coconino County Wildlife Connectivity Assessment: Report on Stakeholder Input" (Arizona Game and Fish Department 2011) provides background information on the importance and benefits of conserving wildlife linkages for both people and wildlife in Coconino County. This report was an initial assessment of wildlife movement patterns to be supplemented in the future by further analysis and refinement that includes additional stakeholder input, GIS-based linkage modeling, and research studies of wildlife movement patterns.

In 2013, the "***Coconino County Wildlife Connectivity Assessment: Detailed Linkage*s, *San Francisco Peaks to Mogollon Rim Linkage Design*"** identifies three linkage strands that could provide desirable wildlife connectivity between blocks of wildlands around the San Francisco Peaks and the Mogollon Rim (Arizona Game and Fish Department 2013). The San Francisco Peaks to Mogollon Rim movement area has been identified as a priority by workshop attendees and is supported by County planners with

knowledge of future growth patterns and potential conservation opportunities. The Garland Prairie Strand includes ponderosa pine forest, pinyon juniper woodland, high-elevation grassland, and ephemeral wetland and provides live-in and pass-through habitat for species utilizing these habitat types. The Volunteer Mountain Strand follows the wooded highlands on the western edge of the U.S. Army's Camp Navajo installation and is dominated by ponderosa pine forest, with small areas of pinyon juniper and grassland at its southern and western edges. The Woody Ridge Strand is predominantly ponderosa pine forest and encompasses most of north-south trending Woody Ridge east of Camp Navajo.

Arizona State Forestry Division

The Arizona State Forestry Division's (AZSF) mission is to manage and reduce wildfire risk to Arizona's people, communities, and wildland areas and provide forest resource stewardship through strategic implementation of forest health policies and cooperative forestry assistance programs. The AZSF provides for the prevention and suppression of wildland fire on 22 million acres of State Trust land and private property located outside incorporated communities.

Arizona was required by the 2008 Farm Bill to develop a State Forest Resource Assessment. Arizona completed an assessment of forest resources, developed a strategic plan and laid out a 5-year approach to funding projects in June 2010. Although U.S. Forest Service coordination was a requirement of the assessment, the emphasis of the State plan was on State forest lands, as well as private forestry and urban forestry, and not generally on NFS lands. The Secretary of Agriculture approved the plans in 2010.

Arizona State Land Department

The practice of allocating public lands for various beneficiaries in Arizona dates back to the founding of the territory in 1863. The current system of managing these lands, referred to as State Trust lands, was established with the Arizona State Land Department (AZSLD) in 1915. Since its inception, the AZSLD has been granted authority over all trust lands as well as the natural products they provide. This authority over trust land is central to the AZSLD's primary mission of maximizing revenues for its beneficiaries, a role that distinguishes it from other agencies charged with management of public lands (e.g., national parks, national forests, state parks). As of 2008, the AZSLD managed over 9 million acres in land holdings for 14 beneficiaries, the most prominent of which is the K-12 public school system. Most of the State lands can be used for livestock grazing purposes only. Public use of the lands is regulated by permit (Arizona State Land Department 2016a).

The AZSLD may dispose of (i.e., exchange) or lease the lands for natural resource use or commercial development purposes. The AZSLD prepares a 5-year plan that represents potential areas of concern to initiate land sales and long-term leases. As of September 2016, this plan was not available (Arizona State Land Department 2016b).

Arizona State Parks

The mission of the Arizona State Parks (ASP) is to manage and conserve Arizona's natural, cultural, and recreational resources for the benefit of the people, both in our parks and through our partners (Arizona State Parks 2014). Arizona State Parks manage 32 State parks across Arizona. Five of those State parks are near the Coconino NF: Riordan Mansion State Historic Park, Red Rock State Park, Slide Rock State Park, Dead Horse Ranch State Park, and Fort Verde State Park. Arizona State Parks have seen a continual increase in visitation over the years, with over 1,000,000 visitors in 1985, to over 2, 300,000 visitors in 2014 (Arizona State Parks 2014).

"The ***2013 Arizona Statewide Comprehensive Outdoor Recreation Plan" (SCORP)*** identifies the major impacts and trends related to outdoor recreation in Arizona. It also identifies the State's outdoor recreation priorities. These public lands provide opportunities for activities such as picnicking, developed and

primitive camping, wilderness backpacking, hiking, mountain biking, horseback riding, cross-country skiing, wildlife watching, hunting, fishing, boating, water skiing, rock climbing, four-wheel driving, motorized trail biking, all-terrain vehicle riding, and snowmobiling, among others (Arizona State Parks 2013).

"The Arizona Trails 2015: State Motorized and Non-motorized Recreation Trails" plan provides information and recommendations to guide Arizona State Parks and other agencies in their management of trails. The priority recommendations for motorized trails are: protect access to trails/acquire land for public access; maintain and renovate existing trails and routes; mitigate and restore damage to areas surrounding trails, routes, and areas; and establish and designate motorized trails, routes, and areas. The priority recommendations for non-motorized trails are: maintain existing trails, keep trails in good condition; and protect access to trails/acquire land for public access (Arizona State Parks 2015).

Governor's Forest Health Council: Statewide Strategy for Restoring Arizona's Forests

"The Statewide Strategy for Restoring Arizona's Forests" focuses attention on the current condition of our forests and the steps required to restore their health and vigor (Governor's Forest Health Councils 2007). It describes approaches for achieving long-term ecosystem restoration, fire risk reduction around communities, natural fire management in wildlands, and the development of appropriate restoration-related economic opportunities. Based on sound ecological and social science, the statewide strategy incorporates valuable insights and techniques from the successful and innovative efforts already underway in Arizona. The primary purpose of the statewide strategy is to foster the implementation of a comprehensive, systematic effort to restore the ecological integrity of Arizona's forests and woodlands, while at the same time describing how rural communities can benefit from their aesthetic, ecological, and economic resources without compromising forest health and public safety.

Local Government

The Coconino National Forest resides in three counties (Coconino, Yavapai, and Gila Counties), covering approximately 1.8 million acres. County or city comprehensive plans can be used as a source of information on the history of land use within the region, the patterns of development, desired conditions, and current county land use policies. County governments hold no legal authority over independent jurisdictions such as Federal and State lands, incorporated cities and towns, or Native American tribal reservations.

Coconino County

Land under management by the Forest Service makes up 28 percent of Coconino County with most acres within the Coconino and Kaibab National Forests. Coconino County adopted a revision of the 2003 Comprehensive plan in December 2015. The approved final draft is being finalized for publication (Coconino County Community Development Department 2015).

The **"Coconino County Comprehensive Plan (2015)"** serves as a long-range guide for the future, with goals that provide general direction, and policies that specify the location, form, purpose, and acceptable impacts of development. The plan focuses on three pillars of sustainability: environmental, economic, and social. The environmental pillar includes ecosystem services, air quality, water quantity and quality, open space, and climate change. No conflicts between the Coconino County goals and objectives and Coconino NF proposed plan components have been identified.

The **"Flagstaff Regional Plan"** is a development and preservation guide for the city and its surrounding region. The plan contains 22 elements, to include open space and the environment; each element was carefully analyzed and subsequent goals were developed based upon public input and research. Goals and

policies for all of the elements have been formally adopted by the Coconino County Board of Supervisors and Flagstaff City Council and the plan was ratified by the voters in 2014.

City of Flagstaff

The **"Picture Canyon Coordination Plan"** sets forth the land use, management, and treatment of existing uses of the Picture Canyon area acquired by the city of Flagstaff (City of Flagstaff 2015). The elements of this plan details the manner in which the city of Flagstaff will effectively coordinate and carry out transfer of ownership from the State Land Department to the city of Flagstaff to guarantee the protection of existing uses while allowing for the conservation of the natural, cultural, and open space values at Picture Canyon. Coconino County and the city of Flagstaff are long-standing partners in ongoing efforts to restore and preserve Picture Canyon.

The "**Climate Resiliency and Preparedness Study"** helps address the question of how the city can reduce its vulnerability to and build local resilience against risk from climate variability and weather related impacts (City of Flagstaff 2012). The city conducted the resiliency and preparedness study to better understand how the impacts of local climate changes will directly affect city operations. Building local resiliency within the municipal organization to these changes helps ensure continued prosperity.

Yavapai County

The **"Yavapai County Comprehensive Plan"** covers eight topic areas: land use, transportation, water and open space, energy, environment, cost of development, and growth areas (Yavapai County 2012).

The purpose of the **"Beaver Creek Community Vision (Vision 2020)"** is to guide Yavapai County in making decisions and setting priorities in order to promote orderly development (Beaver Creek Regional Council 2011). It organizes and coordinates complex relationships between land, resources, people, and facilities to protect the health, safety, welfare, and convenience of the residents of the community. Further, it sets a direction for growth and change. Vision 2020 applies to private lands where Yavapai County has planning and zoning authority. Objectives in the plan are tied to planning and zoning, transportation, water resources, open space and recreation, and youth and family services.

The **"Sedona Community Plan (Imagine Sedona 2020 and Beyond)"** is a statement of community goals and development policies including maps and text that set forth objectives, principles, standards and proposals (City of Sedona 2014). The community plan is the "road map" for achieving community objectives. The plan guides the city in making decisions about new development and re-zonings, preparing new regulations and ordinances, initiating more specific planning programs, and setting priorities and funding. The community plan update was ratified by voters in 2014 and amended in 2016.

The "**Verde Valley Regional Land Use Plan"** enhances the shared qualities of special places to live and enjoy the outdoor environment. Maintaining distinct community character is a high priority that encourages diverse living opportunities in a small town atmosphere (Yavapai County 2006). Open space preservation, a variety of housing choices, appropriate use of public lands, and transportation connections that complement the region's spaciousness are key components for a balanced land-use pattern (Community Sciences Corporation in Association with Dava & Associates; Lima & Associates (2006).

Community Wildfire Protection Plans

- Blue Ridge and Mogollon Rim Communities Wildfire Protection Plan (Coconino County 2010)
- Flagstaff and Surrounding Communities Wildfire Protection Plan (Greater Flagstaff Forests Partnership and Ponderosa Fire Advisory Council 2012)
- Greater Williams Area Community Wildfire Protection Plan (City of Williams et al. 2005)

- Tusayan Community Wildfire Protection Plan (draft) (Tusayan Community Wildfire Protection Committee 2005)

A community wildfire protection plan is a strategic plan as well as an action plan: it generates a broad operating framework for landowners and resource managers within the area, and identifies community protection priorities. Site-specific planning and implementation remains the responsibility of each owner/management agency, generally operating within the guidelines developed within of the plan. A combination of fuel management, FireWise standards, and appropriate wildfire suppression response will reduce threats to life and property, protect values-at-risk, and create a safe context for the use of fire in subsequent forest ecosystem restoration efforts. These plans outline actions needed to prepare and equip the community to live and thrive within our fire-adapted ponderosa pine forests.

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Appendix C. Methodology and Analysis Process

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Introduction

This appendix further elaborates on the analyses contained in the main body of the document by providing supplemental information about assumptions, data sources, and/or methodologies used. It is, however, not comprehensive. Other documentation may be found in the project record.

Assumptions Common to All Analyses

The following assumptions were made for all analyses. Additional assumptions are provided in each section, where applicable.

- Land management plans do not have direct effects. They do not authorize or mandate any site-specific projects or activities (including ground-disturbing actions). However, there may be implications, or longer-term environmental consequences, of managing the forest under this programmatic framework.
- The plan decisions (i.e., desired conditions, objectives, standards, guidelines, management areas, suitability of areas, and monitoring) will be followed when planning or implementing site-specific projects and activities.
- Law, regulation, and policy will be followed when planning or implementing site-specific projects and activities.
- Funding levels will be similar to the past 5 years. The upper end of the treatments would only be possible under implementation of the Four Forest Restoration Initiative and/or major changes to budgets.
- The planning timeframe for the effects analysis is 10 to15 years; other timeframes may be specified for analysis depending on the resource and potential consequences.
- Specific location, design, and extent of activities implemented under plan alternatives are generally not known because decisions are made on a site-specific (i.e., project-by-project) basis. Therefore, environmental consequences refer to the potential for the effect to occur and are usually only estimates of anticipated effects from implementing plan alternatives. The effects analyses are to be useful for comparing and evaluating alternatives on a forestwide basis. It is not intended to be applied directly to specific locations on the forest.
- Monitoring identified in chapter 5 of the land management plan (monitoring strategy) will occur throughout the life of the plan.
- The land management plan will be amended as needed during the life of the plan.
- Within the 10-year analysis period, some areas would be treated with prescribed fire without a preceding mechanical treatment (Table C- 1. , Table C- 2). See FW-TerrERU-PP-O-2 and FW-TerrERU-MC-MCFF-O-2 in alternatives B (modified), C, and D. Prescribed burning would replicate the natural fire regime and would meet or move towards desired conditions for the area.
- Within the 10-year analysis period, some areas would have mechanical treatments that are not followed by prescribed fire treatments (Table C- 1. , Table C- 2). For alternatives B (modified), C, and D, See FW-TerrERU-PP-O-1, FW-TerrERU-PJ-O-1, and FW-TerrERU-MC-MCFF-O-1.This is an artifact of the analysis period and not a reflection of the proposed treatment. Mechanically treated stands are expected to be maintained with repeated fire treatments over the long term. Under this analysis, those areas treated near the end of the current 10-year period are expected to be treated with fire in the beginning of subsequent 10-year period.

Table C- 1. Acres treated (assumption) under alternative A (over a 10-year period)

ERU	Total low mechanical treatment	Total low prescribed burn	Prescribed burn with no mechanical treatment
PPF	50,000	150,000	100,000
MCF	2,900	8,000	5,100
PJG	1,000	0	0
Total	**53,900**	**158,000**	**105,100**

ERU	Total high mechanical treatment	Total high prescribed burn	Mechanical treatment with no prescribed burn
PPF	260,500	200,000	60,500
MCF	2,900	8,000	6,000
PJG	1,000	0	1,000
Total	**264,400**	**208,000**	**67,500**

Table C- 2. Acres treated (assumption) under alternatives B (modified), C, and D (over a 10-year period)

ERU	Total low mechanical treatment	Total low prescribed burn	Prescribed burn with no mechanical treatment
PPF	50,000	150,000	100,000
MCF	2,900	8,000	5,100
PJG	1,000	0	0
Total	**53,900**	**158,000**	**105,100**

ERU	Total high mechanical treatment	Total high prescribed burn	Mechanical treatment with no prescribed burn
PPF	260,500	200,000	60,500
MCF	15,000	8,000	7,000
PJG	10,000	0	10,000
Total	**285,500**	**208,000**	**76,500**

- Mechanical treatment of vegetation can involve re-entry in subsequent years to address the slash from the treatment. Some slash treatment methods include collection and removal, chipping or other forms of mastication, and pile burning. Pile burning occurs on about 10 to 15 percent of the annual acreage for mechanical treatments.
- For alternatives B (modified), C, and D, wildfires that are managed for resource objectives would be utilized when possible to reduce fuel loading in wildland-urban interface (WUI) areas and to restore natural fire regimes.
- For all alternatives, it is assumed that a range of 5,000 to 50,000 acres are burned annually using wildfires that are managed for resource objectives, with an average of approximately 15,000 acres each year, as shown in Table C- 3 below. See FW-TerrERU-PP-O-3, FW-TerrERU-MC-MCFF-O-3, and FW-TerrERU-PJ-O-3 for objectives associated with Alternatives B (modified), C, and D. To mimic the natural fire regime, Ponderosa Pine, Mixed Conifer with Frequent Fire, and Pinyon Juniper with Grass would be managed for low severity fire, while Pinyon Juniper Evergreen Shrub would be managed for mixed severity fire. These percentages are representative of what the forest's currently manages and are based on fuel conditions, smoke management considerations, firefighting capability, leadership and resource availability, and fire policy.

Table C- 3. Acres of wildfires managed for resource objectives (assumption) under all alternatives (over a 10-year period)

ERU	Wildfires managed for resource objectives
PPF	135,000
MCF	7,500
PJG	3,750
PJES	3,750
Total	**150,000**

- The Clean Air Act of 1970 mandates that every state have a statewide implementation plan to regulate pollutants. Smoke is regulated with oversight and compliance by the State of Arizona's Department of Environmental Quality. Arizona's implementation plan requires that Federal and State land management agencies submit the following prior to implementation of a planned ignition: annual registrations, prescribed fire burn plans, and prescribed burn requests and obtain authorizations to burn[1].
- Prescribed fire produces lower emissions than wildfire because less fuel is typically consumed and the conditions are carefully chosen to minimize smoke impacts and to meet resource objectives. A wildfire managed for resource objectives would have similar smoke effects to a prescribed fire, given similar fuel conditions and weather.
- The majority of the Coconino NF is comprised of fire-adapted ERUs that require frequent low severity fire to maintain their historic range of variability. Therefore, smoke from fires is inevitable, regardless of the type of fire that may occur (that is, wildfires or prescribed fires).
- The use of administrative roads contributes less fugitive dust than public access roads because their effects can be mitigated at the project level by timing restrictions and site-specific design of projects and permits.
- The presence of a road itself does not generate a measureable amount of fugitive dust unless it is located in the fine sandy loam surfaces of the Supai formation, calcareous soils of the Verde Formation or alluvium derived from calcareous soils in high or very high wind erodibility groups where soil particles are naturally loose and detached and easily transported by wind. Traffic is the main source of soil detachment from roads.

Air Quality

The methodology and assumptions for air quality was broken into three sections: smoke management, visibility, and other forest activities that affect air quality. The references for this section are located in Volume 2 of the FEIS.

Smoke Management

Plan alternatives, independent of Ecological Response Unit (ERU), affect fire smoke impacts to communities. The evaluation of air quality assesses ERUs together because vegetation type is not as important as other physical factors influencing smoke production from fire. The smoke impacts discussed below consider management actions in the short term (15 years) and then are covered at the end of this section in the long term (50 years).

[1] http://www.azdeq.gov/environ/air/smoke/download/prules.pdf

Actual smoke impacts to communities are dependent on numerous factors that are difficult to predict over the long term such as: ventilation parameters, live and dead fuel moistures, wind direction and speed, firing techniques, timing and duration of ignition, and vegetation type and coarse woody debris; smoke impacts are related much more closely to these factors than guidance in plan alternatives. Smoke models used at the project level allow the modeler to incorporate real-time data. However, at a programmatic, forestwide scale, the uncertainties associated with these data are too great to allow for reliable analysis using these tools. On this scale, emission concentrations or National Ambient Air Quality Standards (NAAQS)[2] could not be estimated.

There are six criteria pollutants for which NAAQS have been set: (1) carbon monoxide (CO), (2) lead, (3) nitrogen dioxide (NO_2), (4) particulate matter smaller than 10 micrometers in diameter (PM_{10}) and particulate matter larger than 2.5 micrometers in diameter ($PM_{2.5}$), (5) ozone, and (6) sulfur dioxide (SO_2) (see Table C- 4). Therefore, estimated smoke impacts focus on trends which require making some assumptions based on interpretation of Arizona Department of Environmental Quality (ADEQ) monitoring and literature. ADEQ uses three eBAM[3] monitors in Sedona, Flagstaff, and Camp Verde to monitor particulate matter in the smoke management units (airsheds) associated with the Coconino NF. These monitors provide concentrations in 1-hour, 4-hour, and 24-hour intervals.

Smoke impacts estimated below focus on trends. For this analysis, smoke impacts are assessed in terms of smoke impacts associated with treatments in the short term and smoke impacts associated with uncharacteristic fires in the long term. Another factor related to smoke impacts is "season of implementation," which greatly influences ventilation. However, the alternatives do not impact this factor; therefore, this factor is not discussed.

Particulate matter is described as very fine solid particles suspended in smoke. Regarding NAAQS pollutants, these concentrations have a varying time weighted period depending on the pollutant. For $PM_{2.5}$ and PM_{10}, they are measured as a 24-hour average. "The major pollutant of concern in smoke from fire is fine particulate matter, both PM_{10} and $PM_{2.5}$. Studies indicate that 90 percent of all smoke particles emitted during wildland burning are PM_{10}, and 90 percent of PM_{10} is $PM_{2.5}$ (Ward and Hardy 1991). The most recent human health studies on the effects of particulate matter indicate that fine particles, especially $PM_{2.5}$, are largely responsible for health effects including mortality, exacerbation of chronic disease, and increased hospital admissions (Dockery and others 1993; Schwartz and others 1996)" [USDA Forest Service 2002b]. $PM_{2.5}$ particles can become lodged in the deepest part of the respiratory system and are difficult for the body to expel.

Table C- 4. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m3)	8-hour (1)	None	
	35 ppm (40 mg/m3)	1-hour (1)		
Lead	0.15 µg/m3 (2)	Rolling 3-Month Average	Same as Primary	

[2] NAAQS are set by Environmental Protection Agency regulations under their authority from the Clean Air Act (for more information see Affected Environment).
[3] eBAM is an instrument used to monitor particulate matter. It is produced by Met One.

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Nitrogen Dioxide	53 ppb (3)	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour (4)	None	
Particulate Matter (PM_{10})	150 µg/m3	24-hour (5)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m3	Annual (6) (Arithmetic Average)	Same as Primary	
	35 µg/m3	24-hour (7)	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour (8)	Same as Primary	
	0.08 ppm (1997 std)	8-hour (9)	Same as Primary	
	0.12 ppm	1-hour (10)	Same as Primary	
Sulfur Dioxide	0.03 ppm (11) (1971 std)	Annual (Arithmetic Average)	0.5 ppm	3-hour (1)
	0.14 ppm (11) (1971 std)	24-hour (1)		
	75 ppb (12)	1-hour	None	

Even though carbon monoxide (CO) from fire is a small contribution to air quality effects, like particulate matter, it can contribute large short-term concentrations. CO production and particulate matter are expected to be higher when more fuels are consumed, as demonstrated by uncharacteristic wildfires such as the Schultz Fire (2010) or Wallow Fire (2011). These uncharacteristic wildfire events are unpredictable in terms of the timing, frequency, and size of their occurrence, but they are less likely to occur in areas that are treated in a manner that results in vegetative structure, composition, and fuel loads that approximate historic conditions of the given vegetation type. Typically, prescribed fires and wildfires that can be managed for resource objectives have lower emissions in dry frequent fire forest types than fires with uncharacteristic fire behavior and fire effects (Lata 2011).

Only prescribed fire activity is typically regulated for smoke management (such as visibility and criteria pollutants) because wildfires are considered “natural events,” which are excluded under the NAAQS regulations. However, sustained exceedance of air quality standards, such as a wildfire, may be investigated by EPA to determine if it is an exceptional event.

“Season of implementation,” or the time of year burns take place, is a factor that greatly influences ventilation and would have more effect on smoke impacts than number of burn days or acreage burned per day; however, this factor is more appropriately evaluated at the project level. While the factors influencing smoke production do vary by season, the plan alternatives do not contain direction or restrictions about seasonality of burning that would drive difference between the alternatives. Project-level decisions about when to burn would vary by the specifics of the site conditions and the desired conditions for the project, as well as ADEQ’s enhanced smoke management programs that Federal agencies follow. In addition, climate change may add increased uncertainty when predicting the season of implementation.

Uncharacteristic wildfires are those that occur under vegetative conditions that are not typical to the vegetation types’ historic fire regime. In many cases, uncharacteristic wildfires occur under hotter,

drier conditions with more continuous fuel, and they grow faster and produce more smoke than fires that burn under conditions that are closer to the historic range of variability. When fires occur under conditions closer to this range, the agency may be able to manage them to maintain the historic range of variability and to benefit wildlife, soils, watersheds, and other ecological components of the respective ecosystem. This environmental impact statement distinguishes between the types of impacts that occur under uncharacteristic wildfires and wildfires managed to meet resource objectives. This information is based on smoke modeling completed by Mary Lata, fire ecologist for the Four Forest Restoration Initiative[4] team, which estimates the differences between emissions produced by fire occurring under conditions representative of the historic range of variability on-site for the Ponderosa Pine vegetation type on the Coconino and Kaibab NFs, and current conditions (Lata 2011).

Several evaluation criteria have been adopted to measure the effects of these other forest activities. Prescribed fire treatments on the forest create smoke that has the potential to impact air quality. This analysis uses the NAAQS standards for air quality as evaluation criteria for smoke associated with prescribed fire treatments. This analysis also considers how management of wildland-urban interface, designated wilderness, and areas managed for unroaded recreation setting can impact levels of smoke over the short term and the long term.

Visibility

"Atmospheric visibility is affected by scattering and absorption of light by particles and gases. Particles and gases in the air can obscure the clarity, color, texture, and form of what we see. Fine particles most responsible for visibility impairment are sulfates, nitrates, organic compounds, elemental carbon (or soot), and soil dust. Sulfates, nitrates, organic carbon, and soil tend to scatter light, whereas elemental carbon tends to absorb light. Fine particles ($PM_{2.5}$) are more efficient per unit mass than coarse particles (PM_{10} and larger) at causing visibility impairment" (USDA Forest Service 2002b).

For this report, visibility will be considered in areas designated as Class I areas under the Clean Air Act. A Class I area, designated by the Clean Air Act, is a classification that requires the highest level of protection under the act. Projects which may potentially impact Class I areas must address efforts to minimize smoke impacts on visibility.

"Regional haze is visibility impairment produced by a multitude of sources and activities that emit fine particles and their precursors and are located across a broad geographic area. This contrasts with visibility impairment that can be traced largely to a single, large pollution source. Until recently, the only regulations for visibility protection addressed impairment that is reasonably attributable to a permanent, large emissions source or small group of large sources" (USDA Forest Service 2002b).

"In 1999, EPA issued regional haze regulations to manage and mitigate visibility impairment to Class I areas from the multitude of diverse regional haze sources (40 CFR Part 51)" (USDA Forest Service 2002b). Wildfires and windblown dust are considered "natural" sources of emissions and the goal of the Southwestern Regional Haze Implementation Plan (ADEQ 2011) is to maintain visibility as close to natural levels as possible, not to maintain clear skies that allow for maximum visibility. Fugitive dust from human-caused disturbances (e.g., roads and construction sites) are considered sources of emissions that affect visibility, which can be managed to maintain as natural a level of visibility as possible (ADEQ 2011). Uncharacteristic wildfires may increase haze above natural levels because of

[4] The Four-Forest Restoration Initiative is a collaborative effort to restore forest ecosystems on portions of four national forests in northern Arizona: Apache-Sitgreaves, Coconino, Kaibab, and Tonto.

their severity, timing, and fuel conditions. Prescribed fires and wildfires that can be managed for resource objectives are managed to more closely mimic historic fire conditions, thus limiting their contribution to visibility impacts. Prescribed fires may be preceded by mechanical treatments that further reduce fuel consumption and therefore reduce the risk of uncharacteristic wildfire and associated effects to visibility.

Prescribed fire activities result in increased amounts of lower levels of haze in the short term, but create the benefit of decreased amounts of higher levels of haze in the long term. Days with heavier smoke emissions can have unnatural impacts to visibility in Class I areas. This analysis uses the number of days with heavier smoke emission as an evaluation criteria visibility in Class I areas.

Other Forest Activities that Affect Air Quality

Fugitive dust is particulate matter which detaches from the soil and becomes airborne. Like other particulate matter, fugitive dust has the potential to adversely affect human health and visibility. It can be caused by driving on dirt roads, uncovered haul trucks, or soil detaching and becoming airborne under dry, windy conditions with bare soil. Fugitive dust is analyzed using the vegetation types that are most likely to have soil detachment because of dry conditions and amount of bare soil, typically present: Pinyon Juniper Woodlands, Pinyon Juniper Evergreen Shrub, Semi-desert Grasslands, Pinyon Juniper with Grass, Interior Chaparral, and Desert Communities. Since motorized vehicle use is limited to roads and trails (except for administrative activities), only publicly open roads were considered for contributing to fugitive dust. These roads would have the most traffic and contribute to soil detachment. Roads that are available for administrative use only would have much lower traffic on a regular basis, and they may for short periods (e.g., during an active timber sale) and in localized areas have higher traffic volumes that contribute to soil detachment. While the timing and conditions of these administrative uses may be adjusted to mitigate fugitive dust, the use of a road by the public is not controllable unless there is a road closure. Consequently, the underlying condition that may vary based on the availability of these roads by alternative is public access on the forest. The analysis for fugitive dust was conducted qualitatively.

Several evaluation criteria have been adopted to measure the effects of these other forest activities. Mechanical treatments may increase the NO_2 emissions on the forest. This analysis uses the NAAQS standard for NO_2 as an evaluation criteria for emissions associated with mechanical treatments. Campfire restrictions in Oak Creek Canyon and the associated smoke have the potential to impact visibility and air quality. This analysis uses the NAAQs standards for PM_{10} and $PM_{2.5}$ as evaluation criteria for campfire smoke in Oak Creek Canyon. Finally, there is currently no regulation of fugitive dust by the State or local government in or around the Coconino National Forest, but dust is a source of PM_{10} when measuring air quality. This analysis uses the NAAQS standard for PM_{10} as an evaluation criteria for fugitive dust.

Assumptions for Air Quality

In the analysis for air quality, additional assumptions have been made:

- For the forest's annual prescribed fire treatments: 95 percent are in the Ponderosa Pine vegetation type and 5 percent are in the Mixed Conifer with Frequent Fire vegetation type.
- For alternatives B (modified), C, and D, wildfires that are managed for resource objectives would be utilized when possible to reduce fuel loading in wildland-urban interface (WUI) areas and to restore natural fire regimes.

- The location and timing of lightning is critical for natural ignitions of wildfires that can be managed for resource objectives. Due to the unpredictable nature of when and where lightning will strike, estimating the gain or loss of opportunities to manage wildfires for resource objectives is imprecise. For all alternatives, it is assumed that a range of 5,000 to 50,000 acres are burned annually using wildfires that are managed for resource objectives, with an average of 15,000 acres each year. See FW-TerrERU-PP-O-3, FW-TerrERU-MC-MCFF-O-3, and FW-TerrERU-PJ-O-3 for objectives associated with alternatives B (modified), C, and D. To mimic the natural fire regime, Ponderosa Pine, Mixed Conifer with Frequent Fire, and Pinyon Juniper with Grass would be managed for low-severity fire, while Pinyon Juniper Evergreen Shrub would be managed for mixed-severity fire. These percentages are representative of what the forest currently manages and are based on fuel conditions, smoke management considerations, firefighting capability, leadership and resource availability, and fire policy.
- Other forest activities, such as mechanical treatment, would likely reduce smoke impacts (indirectly) in the long run because they reduce the probability of undesirable wildfires. Mechanical treatments reduce an ERU's departure by reducing tree density, thereby, increasing fire resilience and lower the probability of uncharacteristic fire. However, this is only true given follow-up treatment (piling and burning or just prescribed burning) to reduce the fuels activity created from mechanical treatment.
- The majority of the Coconino NF is composed of fire-adapted vegetation types that require frequent low-severity fire to maintain their historic range of variability. Therefore, smoke from fires is inevitable, regardless of the type of fire that may occur (i.e., wildfires or prescribed fires).

Watersheds and Water

The following describes the methodology and analysis processes used to determine the environmental consequences on watershed condition and water quality and quantity from implementing the alternatives. Environmental consequences are not site specific at the broad forest planning level and will be described with qualitative descriptions supported by past studies and observations. Much of the background information is found in the "Ecological Sustainability Report" (USDA Forest Service 2009b) and its supporting specialists' reports in addition to the initial assessment of watershed condition using the national watershed condition framework and assessment tool conducted in March 2011 (USDA Forest Service 2011d). The references for this section are located in Volume 2 of the FEIS.

Watersheds

Watershed condition is the state of the physical and biological characteristics and processes within a watershed that affect the hydrologic and soil functions that support aquatic ecosystems. Watershed conditions at the 6th code according to the Hydrologic Unit Code (HUC)[5] have been determined and are appropriate to be used at the planning level. The initial assessment was conducted in March 2011 using the national watershed condition framework and assessment tool technical guide (Potyondy and Geier 2010, Potyondy and others 2011). The results of that assessment are presented in watershed affected environment. The environmental consequences section provides a qualitative assessment each alternative's forecasted trends for watershed condition based on the concept of concentrating restoration treatments within identified focus watersheds. In a more general sense, the

[5] The United States is divided and subdivided into successively smaller hydrologic units which are classified into six levels: regions, subregions, accounting units, cataloging units or subbasins, watersheds, and subwatersheds. The hydrologic units are arranged within each other, from the smallest (subwatersheds) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of 2 to 12 digits based on the 6 levels of classification in the hydrologic unit system.

environmental consequences section describes potential effects from forest restoration activities, recreation and roads, grazing, special uses, and climate change on watershed condition.

Below are the definitions of watershed condition from the Watershed Condition technical guide (Potyondy and others, 2011):

- **Class 1 watersheds (Functioning Properly)** exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- **Class 2 watersheds (Functioning at Risk)** exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- **Class 3 watersheds (Impaired Function)** exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

Watershed that are Functioning Properly provide for high biotic integrity, which includes habitats that support adaptive animal and plant communities that reflect natural processes. They are resilient and recover rapidly from natural and human disturbances. They exhibit a high degree of connectivity longitudinally along the stream, laterally across the floodplain and valley bottom, and vertically between surface and subsurface flows. They provide important ecosystem services, such as high quality water, the recharge of streams and aquifers, the maintenance of riparian communities, and the moderation of climate variability and change. They maintain long-term soil productivity.

Water Quality and Quantity

Water quality has been assessed in major perennial stream reaches and lakes on the forest. The general classification used for surface water quality by ADEQ designates each waterbody in one of five categories:

- **Category 1 (attaining all uses)** - All designated uses of surface waters are assessed as "attaining."
- **Category 2 (attaining some uses)** - Each designated use of surface waters is assessed as either "attaining," "inconclusive," or "threatened."
- **Category 3 (inconclusive)** - All designated uses of surface waters are assessed as "inconclusive" due to insufficient data to assess any designated use (e.g., insufficient samples or core parameters). By default, this category would include waters that were "not assessed" for similar reasons
- **Category 4 (not attaining)** - At least one designated use of surface waters is assessed as "not attaining" and no uses are assessed as "impaired." A Total Maximum Daily Load[6] (TMDL) analysis will not be required at this time for one of the following reasons:

  4 A. - A TMDL has already been completed and approved by the Environmental Protection Agency (EPA) but the water quality standards are not yet attained.

  4 B. - Other pollution control requirements are reasonably expected to result in the attainment of water quality standards by the next regularly scheduled listing cycle.

[6]A TMDL is a written analysis that determines the maximum amount of a pollutant that a surface water can assimilate (the "load"), and still attain water quality standards during all conditions. The TMDL allocates the loading capacity of the surface water to point sources and nonpoint sources identified in the watershed, accounting for natural background levels and seasonal variation, with an allocation set aside as a margin of safety.

4 C. - The impairment is not related to a "pollutant" loading but rather due to "pollution" (e.g., hydrologic modification).

- **Category 5 (impaired)** - At least one designated use of surface waters is assessed as "impaired" by a pollutant. These waters must be prioritized for TMDL development.

Water quality is assessed by comparing existing conditions (Categories 1 to 5) with desired conditions that are set by Arizona under authority of the Clean Water Act. Waters that are not impaired (those not on the 303d[7] list or in Categories 4 or 5) are providing for beneficial uses identified for that stream and can be considered in a desired condition until further sampling indicates impairment. Those in Category 2 or higher require special attention during site-specific project analysis. ADEQ is the regulating authority for water quality in Arizona as promulgated by EPA.

ADEQ also interprets its surface water quality standards to apply to "intermittent, non-navigable tributaries." ADEQ interprets the definition of "surface water" to include tributaries and assigns water quality standards to intermittent surface waters that are not specifically listed by name in Arizona's surface water quality standards rules. ADEQ considers it necessary to regulate and protect these types of waters as "waters of the United States," because it is estimated that approximately 95 percent of the surface waters in Arizona are either intermittent or ephemeral.

Assumptions for Watersheds

In the analysis for watersheds, additional assumptions have been made:

- Focus (or priority) watersheds are the designated watersheds where restoration activities will concentrate on the explicit goal of improving watershed condition. As of March 2016, the selection of these watersheds is yet to come, however, once selected, will be a major consideration for implementation of projects in some alternatives. The following sections qualitatively describe and compare the effects to watershed condition by the types of activities allowed under the description of alternatives, and how each alternative influences where work will be concentrated. Water Quality and Quantity Assumptions.
- The "Watershed Condition Framework" provides a 6-step process for watershed-wide restoration. The forest has completed step A, classification of 6th code watershed condition and two Watershed Restoration Action Plans and moved one watershed (Barbershop Canyon) into an improved class by completing all essential projects. For other watersheds, the remaining steps prioritize, plan treatments, implement treatments, track accomplishments and verify and monitor watershed improvement are ongoing. The actual improvement rate of watershed condition is dependent on funding and support levels from internal sources as well as other land owners within the focus watershed.

Assumptions for Water Quality and Quantity

In the analysis for watersheds, additional assumptions have been made:

- Data used in this analysis represent forestwide conditions and may not represent water quality or flow conditions at any given point across the landscape. On-site inspection should be conducted

[7] Under section 303(d) of the Clean Water Act of 1972, states, territories, and authorized tribes are required to develop lists of impaired waters. These impaired waters do not meet water quality standards that states, territories, and authorized tribes have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters. (https://www.epa.gov/tmdl/epa-documents-arizona-section-303d-list)

for site-specific project assessments. Water quality data for not attaining (categories 4 and 5 and EPA listed waters) is derived from the 2004/2006, 2006/2008, and latest ADEQ 305 b report 2012/20014 (ADEQ 2004, 2008, and 2015) and EPA listed waters. Water in categories 1-3 are summarized from ADEQ data in the 2004/2006 305b report. A more detailed description of existing water conditions can be found in the Water Resources Specialist's Report for the Ecological Sustainability Report for the Coconino NF (USDA Forest Service 2007).

- Reference or historic water quality was assumed to be sufficient to sustain ecological systems and species and be of equivalent quality as attaining all uses as intended by the State water quality standards. Nonpoint sources of pollution such as roads, timber harvesting, extensive livestock grazing, recreation, and non-characteristic fire were neither widespread nor frequent.
- Reference levels of water yield are unknown; however, research suggests that water yield in pre-settlement, open-canopied ponderosa pine forests was higher than in the closed-canopy forests that are prevalent today (USDA Forest Service 2007). Studies in paired watersheds (watersheds that are similar in nature with regard to their vegetation and soils) in Arizona have shown that there was a short-term increase in water yield following thinning in ponderosa pine forests (Moir and Ludwig 1979).
- The recent drought, along with overstocked forests, has reduced flows in some stream reaches and some watersheds (Little Colorado River watersheds and Verde River watersheds). Overall forest water yield[8] has been static to slightly downward over the last 20 years due to the following two conditions.
- Greater tree and shrub basal area and cover has been observed in several vegetation types or ERUs and recorded over the last 20 years (see aerial photo analysis and Anderson Mesa Landscape Scale Assessment Vegetation Group Specialist Report, USDA Forest Service 2004), which may result in increased evapotranspiration and decreased runoff and water yield.

Riparian Resources (Riparian Forests, Wetlands, Streams, and Springs)

This section describes the methodology and analysis processes used to determine the environmental consequences on riparian resources including wetlands, streams, and springs from implementing the alternatives. Much of the background information is found in the Ecological Sustainability Report and its supporting specialists' reports. The references for this section are located in Volume 2 of the FEIS.

The Riparian Area Survey and Evaluation System (RASES) (USDA Forest Service 1989) is a site-specific riparian area survey specific to the Coconino NF that inventoried stream (i.e., lotic) riparian areas on the forest. It offers the best spatial information of riparian area location, type, condition, and future potential for ecosystem diversity analysis at the forest planning level and below. Riparian vegetation condition was determined and summarized by 4th and 5th code HUC watersheds by the following Riparian Areas: Cottonwood Willow Riparian Forest, Mixed Broadleaf Deciduous Riparian Forest, Montane Willow Riparian Forest, and Wetlands.

The forest's GIS layer has been updated using RASES data and more recent Regional Riparian Mapping Project (RMAP) mapping. RASES uses a narrower geographical extent than RMAP, and therefore, interpolating these two data sources requires the assumption that the larger, regionally

[8] Output of water yield or water supply (used synonymously in this analysis) is the amount of water which leaves the immediate site to become surface water yield or groundwater recharge. Essentially, it is the difference between total precipitation and actual evapotranspiration.

mapped area is proportionally in the same condition as the RASES on-site evaluation. The more recent Region 3 RMAP data was used to delineate riparian areas including streams, wetlands and cienegas with the ability to determine polygon acreage. The RASES segments were aggregated into RMAP riparian areas and into riparian forest types. In addition, recent GIS processing of stream and wetland PFC data (April 2015) includes more accurate departure and trend data by 4th and 5th HUC watershed resulting in some minor changes to departure and trend information since the DEIS and is included in this analysis. All percent departure numbers should be considered approximate. No actual changes in riparian functional condition have occurred since what was reported in the DEIS.

Since the mid-1990s, the forest has utilized proper functioning condition (PFC) classification system (USDI Bureau of Land Management 1998 and 2003) to determine the condition of riparian areas, including streams, wetlands, and some springs. The PFC inventory for the forest was derived from on-site evaluation collected from 1989 to 2007 on more than 95 percent of the known forest riparian areas. The PFC classification system is a consistent approach to determine how well physical processes are functioning. It is a qualitative assessment based on quantitative science.

PFC lotic (streams) and lentic (wetlands) classes are defined as follows:

Proper functioning condition - Riparian and wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to:

- dissipate stream (water) energy associated with high flows, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid in floodplain development;
- improve flood-water retention and ground-water recharge;
- develop root masses that stabilize streambanks;
- develop diverse ponding and channel characteristics to provide habitat for fish, waterfowl and other uses, and support greater biodiversity.

Functional at risk (FAR) - Riparian and wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Nonfunctional (NF) - Riparian and wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream or water energy associated with high flows, and this are not reducing erosion or improving water quality.

Unknown - Riparian and wetland areas for which there is insufficient information on to make any form of determination.

A qualitative estimate was made of the trend from reference to current riparian condition by reviewing forest data and projecting the estimated change in trend for upland and riparian vegetation condition (USDA Forest Service 2007). Table C- 5 shows the departures for riparian resources. Departure values were determined by identifying the percentage of the riparian resource that was not in proper functioning condition. Stream and wetland condition is considered highly departed from reference conditions when 66 percent or more of inventoried riparian areas are functioning at risk or nonfunctional. Low departure is when less than 33 percent of inventoried riparian areas are functioning at risk or nonfunctional. Moderate is between low and high (33 to 65 percent).

Table C- 5. Riparian Forest departure (total miles with data)

ERU	Condition	Miles by PFC Class	Reference Percent	Current Percent	Departure Value
Cottonwood Willow Riparian Forest (83 miles)	PFC	24.2	100	57	
	FAR	17.9	0	42	
	NF	0.5	0	1	
			100	100	43%
Mixed Broadleaf Deciduous Riparian Forest (117.3 miles)	PFC	134.7	100	69	
	FAR	55	0	28	
	NF	4.7	0	3	
			100	100	21%
Montane Willow Riparian Forest (262.9 miles)	PFC	185.2	100	71	
	FAR	57.9	0	22	
	NF	18.8	0	7	
			100	100	29%
Gallery Coniferous Riparian Forest* (unknown)	PFC	2.5	Assumed 100	Assumed 100	
	FAR	0	0	0	
	NF	0	0	0	
			100	100	0%

*Updated riparian mapping indicates that Gallery Coniferous Riparian Forest does not occur on the forest. The areas formerly classified as Gallery Coniferous (upper end of West Fork and Jack's Canyon for example) more likely fall under the Mixed Broadleaf Deciduous or Montane Willow Riparian Forest types but this would be decided at the project level.

Table C- 6. Wetland departure (total number/total acres)

Condition	Total Wetlands/ Total Acres (73/9,160)	Reference Percent	Current Percent	Departure Value
PFC	36 wetlands/8,201 acres	100	56/82	
FAR	28 wetlands/780 acres	0	44/8	
NF	0	0	0	
Not Assessed	14 wetlands/947 acres		18/10	
		100	100	8 to 18%

Assumptions for Riparian Resources

In the analysis for riparian resources, additional assumptions have been made:

- Riparian functional condition for all known riparian areas was mapped as linear segments (or stream reaches) using the forest's RASES stream GIS layer as a base and assigning proper functioning condition (PFC) attributes to each stream reach. This information was derived from actual PFC surveys (inventoried). Some mapped RASES riparian area reaches do not fall within the four riparian forest types. Riparian departure values and interpretations within any of the four riparian forest types are based on the RASES segment mapped in that riparian forest type. Overall forestwide PFC information includes all PFC mapped within riparian forest types and those mapped outside of riparian forest types.
- Recent additions to the riparian spatial layer stemming from more accurate riparian mapping include several cienegas associated with the wetland/cienega spatial layer. As a result, no riparian condition information was collected for these new additions in the RASES inventory, and therefore, they are not included in this analysis. Another forest condition assessment was later performed and assessed the functional condition of RASES stream reaches.

Assumptions for Wetlands and Springs

In the analysis for Wetlands and Springs, additional assumptions have been made:

- Impacts from humans in reference conditions were neither widespread nor frequent; consequently these water features were in proper functioning condition.
- Most springs that are accessible and unfenced are not in proper functioning condition due to recreation impacts or excessive use from permitted livestock or wildlife.
- Where stream and spring riparian areas are not accessible by livestock, elk and humans, those areas have been observed to be in functional riparian condition and are assumed to be so where not formally assessed.

Biophysical Features

Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope)

The analysis for these resources focuses on the consequences of managing geological features, such as the existing caves, cliffs, sink holes, lava tubes, fissures, and talus slopes on the forest. It also identifies management concerns. These features are generally described using information from available literature and from internal Forest Service documents. By law, cave information is confidential; information will not be disclosed that could be used to determine the location of caves on the forest except for the one designated recreational cave, the Lava River Cave. The names of caves designated as significant or potentially significant will not be disclosed because this could provide location information. For the analysis, the Plan alternatives were compared based on how they would protect and preserve the geologic and biophysical features and conserve the scientific values of these resources; therefore, this was a qualitative analysis. The references for this section are located in Volume 2 of the FEIS.

Assumptions for Geological Features

In the analysis for caves, cliffs, sinkholes, lava tubes, fissures, and talus slopes, additional assumptions have been made:

- The forest will follow the significant cave nomination process, complete annual reporting of cave management activities, and may nominate more caves as significant in the future by the forest supervisor.

Paleontological Resources

The analysis focuses on the consequences of managing the existing known and potential (i.e., unknown) paleontological resources on the forest. Paleontological resources are generally described using information from available literature and from external agency information mainly found on the Department of the Interior's websites containing geologic resource information for Tuzigoot, Montezuma Castle and Well, Walnut Canyon, Sunset Crater Volcano, and Wupatki National Monuments.[9] By law, paleontological resource information is confidential for vertebrate fossils, tracks, and trackways; thus, information will not be disclosed that could be used to determine the location of fossil localities on the forest. Management concerns with paleontological resources are also identified.

[9] http://www.nature.nps.gov/geology/inventory/gre_publications.cfm

All lands of the national forest would be protected similarly by the Paleontological Resources Preservation Act and final implementing regulations regardless of management area or type of special area such as established and proposed research natural areas and botanical and geological areas; designated and recommended wilderness areas; and eligible and designated wild and scenic rivers, national trails, scenic roads, and inventoried roadless areas. The analysis does not include a comprehensive analysis of the probable fossil yield classification of any of the existing or proposed/ recommended management areas or special areas because of the small number of paleontological sites known on the forest and because many special areas overlap multiple bedrock types. If a proposed or recommended special area is known to have a fossil site, then that is explained. In addition, the effects to paleontological resources site protection and enhancement and interpretation are generally similar among the different types of special areas.

Assumptions for Paleontological Resources

In the analysis for paleontological resources, the additional assumptions were made:

- The alternatives were compared on the basis of how they would protect and preserve paleontological resources and conserve the scientific values of the areas.
- This was a qualitative analysis.

Soil

This section describes the methodology and analysis processes used to determine the environmental consequences on soil condition and productivity from implementing the alternatives. Environmental consequences are not site-specific at the broad forest planning level and will be described with qualitative descriptions supported by past studies and observations. Much of the background information is found in the Ecological Sustainability Report (ESR) (USDA Forest Service 2009b) and the supporting specialist reports.

The forest soils are described in the "Terrestrial Ecosystem Survey of the Coconino NF" (USDA Forest Service 1995c). The terrestrial ecosystem survey is the result of a systematic analysis, mapping, classification, and interpretation of terrestrial ecosystems (also known as ecological types) which are delineated and numbered in ecological units. It is the only seamless mapping of vegetation and soils available across the forest that identifies sites that have been field visited, validated, and correlated according to stringent regional and national protocol and stems from years of work. Major fieldwork was completed from 1987 to 1991. Soil names and descriptions were approved in 1992.

Soil condition is based on the primary functions of soil hydrology, soil stability, and nutrient cycling as described by Southwestern Region Supplement Forest Service Handbook 2509.18. The current soil condition rating is described in the "Ecological Sustainability Report," and was based on how departed soils are from the historic range of natural variability. Soil condition information was collected in the field during the Terrestrial Ecosystem Survey (USDA Forest Service 1995c) and used and more recently (2000 – 2015) while collecting soil condition information using the soil condition protocol. TES map units were aggregated based on vegetation type into ERUs and a soil condition rating assigned based on TES and field data collected. In general, past anthropogenic disturbances have altered soil condition from less disturbed, satisfactory historic conditions to current conditions described in this report.

A public comment on the Draft Environmental Impact Statement requested clarification on why there are considerable acres of unsatisfactory and impaired soils for several ERUs (semi-desert grasslands, great basin grasslands, montane/subalpine grasslands, pinyon juniper), riparian forest

types, and wetlands when the forest has given much attention to improving them in the last 40 to 50 years. Much and probably more focus has been given to ponderosa pine harvesting and restoration treatments in the last 40 to 50 years with less focus on the other ERU and riparian forest types mentioned above. However, treatments that have been implemented have resulted in improved soil condition trend in semi-desert grasslands and great basin grasslands ERUs, and cottonwood willow riparian forest type. In addition, trend improves at a slower rate in these because these ecosystems receive less precipitation than others located above the pinyon juniper elevation resulting in slower vegetative growth and related soil condition improvement.

Soil productivity is a combination of soil organic matter, litter cover, and estimated understory and forage production. Information from the terrestrial ecosystem survey was used to establish reference conditions for forage and litter production and current litter cover. It was also used to describe reference condition values and current values for understory and forage production, which were estimated from field observations made forestwide. Organic matter thickness was derived from thickness of the organic surface horizon through soil classification (USDA Forest Service 2009a).

Departures levels in soil condition and productivity were identified as low, moderate, or high. These estimates compared historic and current soil conditions (e.g., erosion, compaction, organic matter, litter cover, understory forage) based on acreage differences between current and historic soil condition by ERU. Percent soils in satisfactory condition under reference conditions is the estimated amount of satisfactory soil conditions before human activities had major influences and disturbances on soil condition (that is, pre-European settlement), and it is based on correlated Terrestrial Ecosystem Survey ecological reference sites.

No models currently exist to predict trends and future foreseeable conditions for soil resources, in particular, soil condition, soil productivity, or soil organic matter. However, qualitative inferences can be made and estimated which provide insight into future soil conditions primarily by using knowledge about present disturbances and their effect on erosion processes, soil compaction, and nutrient cycling. Tables located in the Vegetation and Fire Specialist report (USDA Forest Service 2016a) have been prepared to generally estimate trends and conditions using existing data and current conditions, combined with projected future vegetation conditions derived from the Forest's Vegetation Dynamic Develop Tool (VDDT) models.[10] The VDDT models predict overall dominant vegetation condition and trends and describe relative amounts of the defined ecological states for some ERUs in the future. Dominant vegetation and tree density and canopy cover has an effect on ground cover conditions. Where mechanical treatments that decrease tree canopy cover are proposed, herbaceous understory would improve along with soil condition and specifically soil nutrient cycling function. Therefore, predicted improvements in soil condition from implementing treatments modeled by VDDT are made. Each table highlights combinations of current departure (low, moderate, and high) from reference conditions for soil condition and productivity, which includes soil organic matter, vegetative ground vegetation and plant composition and biomass productivity. Inferences of future conditions and trend were made based on current knowledge of how canopy cover (and ecological state) presently affects these key soil components.

Projected trends in soil condition and soil productivity were based on estimates of the relative change in soil erosion, soil compaction, and soil nutrient cycling by alternative. These estimates use vegetative ground cover and herbaceous understory as indicators to determine the change in soil condition and productivity.

[10] The VDDT models predict overall dominant vegetation condition and trends, and they describe relative amounts of each ERU in the defined ecological states in the future.

Each ERU was examined to see whether soil conditions would generally trend toward, away, or remain static with the implementation of treatments by alternative. The analysis supports the VDDT modeling results for each ERU.

Microbiotic (biological) soil crusts have not been quantified in any detail. However, a qualitative summary may be useful in describing existing conditions and the ecological role of crusts in disturbed ecosystems. Since current composition, extent, and density of crusts have not been inventoried in detail, this analysis infers trends can only be inferred based on current and projected management impacts that have been shown in research to alter populations of crusts and evaluates the consequences of plan components.

Assumptions for Soil

In the analysis for soil, an additional assumption was made:

- Historically, most areas on the forest (89 percent) are inferred to have been in satisfactory[11] soil condition and about 11 percent of the areas were inherently unstable.[12]
- The use of administrative roads contributes less fugitive dust than public access roads because their effects can be mitigated at the project level by timing restrictions and site-specific design of projects and permits.
- The presence of a road itself does not generate a measureable amount of fugitive dust unless it is located in the fine sandy loam surfaces of the Supai formation, calcareous soils of the Verde Formation, or alluvium derived from calcareous soils in high or very high wind erodibility groups where soil particles are naturally loose and detached and easily transported by wind. Traffic is the main source of soil detachment from roads.
- The Watershed Condition Framework provides a consistent way to evaluate watershed condition at both the National and Forest levels. The Watershed Condition Framework consists of reconnaissance level assessments by individual National Forests, implementation of integrated improvement activities within focus watersheds, validation, and monitoring of watershed condition class changes, and aggregation of program performance data for national reporting. The Watershed Condition Framework provides a 6-step process for watershed-wide restoration. The actual improvement rate of watershed condition is dependent on funding and support levels from internal sources as well as other land owners within the focus watershed.
- Focus or priority watersheds are the designated watersheds where restoration activities will concentrate on the explicit goal of improving watershed condition. The selection of these watersheds is yet to come, however, once selected, will be a major consideration for implementation of projects in some alternatives.
- Data used in this analysis represents forestwide conditions and may not represent water quality or flow conditions at any given point across the landscape. On-site inspection should be conducted for site-specific project assessments. Water quality data for not attaining (categories 4 and 5 and EPA listed waters) is derived from the 2004/2006, 2006/2008, and latest ADEQ 305 b report 2012/20014 (ADEQ 2004, 2009, and 2015) and EPA listed waters. Water in categories 1 through 3 are summarized from ADEQ data in the 2004/2006 305b report. A more detailed description of existing water conditions can be found in the Water Resources Specialist's Report for the Ecological Sustainability Report for the Coconino NF (USDA Forest Service 2007).

[11] Satisfactory: soil function is being sustained and soil is functioning properly and normally.
[12] Inherently unstable: soils are naturally eroding faster than they are renewing and are functioning normally.

Vegetation and Fire

The vegetation analysis modeled the potential vegetation conditions resulting from natural disturbances and succession in conjunction with proposed management (human disturbances) for each of the alternatives. The evaluation focused on ecosystem functions associated with the priority needs for change in the "Analysis of the Management Situation" (USDA Forest Service 2010a) and served as the basis for several other resource assessments including species habitats, soil and watershed condition, air quality, and social and economic uses. A number of sources were used to display current conditions. Various models were used to predict trends in vegetation and disturbances in response to natural and anthropogenic forces by alternative. Alternatives were evaluated by their progress toward priority needs for change and associated desired conditions. The effects of plan components on departure and trends are addressed quantitatively and qualitatively for Semi-desert Grassland, Great Basin Grassland, Montane/Subalpine Grassland, Pinyon Juniper with Grass, Ponderosa Pine, and Mixed Conifer with Frequent Fire ERUs. For the remaining ERUs, the effects of plan components on departure and trends are addressed qualitatively. The riparian forest types, Cottonwood Willow Riparian Forest, Mixed Broadleaf Deciduous Riparian Forest, and Montane Willow Riparian Forest are discussed in the Riparian Specialist Report (USDA Forest Service 2016h).

Vegetation Modeling

State-and-Transitions Models (STMs) played a prominent role in the plan revision process in the Southwestern Region. The State-and-Transitions model used for plan revision analysis was the Vegetation Dynamic Development Tool or VDDT. In the first phase of the process, the VDDT was used in the ESR to estimate condition and trends of some of the ERUs and to identify ecological needs for change. Following this, priority needs for change to be addressed in plan revision were identified in the "Analysis of the Management Situation." Over the course of the analysis, the underlying data was updated based on new information when it became available. Between the DEIS and the FEIS, the following changes were made:

- Model outcomes (state distribution and departure values) changed to reflect updated ERU information and treatment assumptions.
- Treatment assumptions for ponderosa pine under alternative A were updated to reflect the consequences of the work authorized under the Four-Forest Restoration Initiative FEIS.
- Treatment assumptions for mixed conifer with frequent fire under alternative B (modified) were updated to reflect a full range of objectives from historic treatment levels on the low end to restoration levels on the high end.
- Potential natural vegetation type (PNVT) categories were replaced with ecological response units (ERU). This resulted in refined boundaries for vegetation communities and regionally consistent descriptions, but did not have a substantial effect on the model outcomes.
- Long term sustained yield and allowable sale quantity also changed as a result of the updated vegetation and timber suitability information.

The VDDT models were improved leading to refined outputs that were used to compare the conditions and trends of ERUs by alternative. VDDT models are further described below.

Several sources were used to determine existing conditions. The primary sources for existing vegetation conditions included:

- Information about the frequency of stand-replacing fire on the Coconino NF and other national forests located along the Mogollon Rim in northern Arizona.
- A classification of ERUs developed and based primarily upon the map units from the Terrestrial Ecosystem Survey. This classification was used to compare existing vegetation to characteristic vegetation.[13] Descriptions of ERUs with characteristic vegetation composition and structure for the Coconino NF were displayed in a spreadsheet.
- A mid-scale vegetation inventory. This inventory, completed in 2008, provided geospatial polygons of life form characteristics (e.g., tree, shrub, and grass-forb), size class (for trees), and canopy cover class across the entirety of both the Coconino and Kaibab National Forests. This data is a mid-scale product meant to represent general landscape vegetation patterns and it is not appropriate for site-specific analyses (Beyerhelm and Mellin 2011). An accuracy analysis of the data was conducted by comparing mid-scale data points to Forest Inventory Analysis data points. The accuracy varied by vegetation type and by structural characteristic. Across all metrics, the overall accuracy varied between 42 percent and 61 percent with specific subcomponents scores ranging higher and lower. This is sufficient for the purposes of evaluating vegetation trends under various management scenarios.
- Forest Inventory and Analysis (FIA) plot data. The FIA plot data was used to: estimate relative proportions of even- and uneven-aged structural conditions on the forest, estimate proportions of various vegetation types within pinyon juniper systems, estimate the amount (percentage) of ponderosa pine-Gambel oak vegetation on the forest, estimate the quantity of snags in ponderosa pine, and calibrate the VDDT model used in predicting vegetative trends (USDA Forest Service 2011f).

Various models were then used to predict trends in vegetation and disturbances in response to natural and human forces by alternative. VDDT was the primary model used to evaluate trends. VDDT is a Windows-based computer tool that provides a modeling framework for examining the role of various disturbance agents (e.g., fires, insects, pathogens) and management actions in vegetation change. The interaction of these disturbances is complex, and the combined effects are difficult to predict over long periods. VDDT provides a way to compare alternatives by testing the sensitivity of the ecosystem to a multitude of activities and agents of disturbance. Using the VDDT model, a vegetation type is assigned various states—some are seral states found within the historic range of variability and others are uncharacteristic states not present in the historic range of variability. Inputs to the VDDT model are agents of disturbance, such as number of acres mechanically treated to restore vegetation stand structure or acres that are burned by fire under low, moderate, or high fire weather conditions. Outputs to the VDDT model are the transition of the vegetation, by percent, from one state to another. For example, an input of high-severity fire would have the effect of move a percentage of dense states to more open states. State descriptions are listed in Table C- 7. Conceptual diagrams projecting transitions in vegetation states (i.e., composition and structure) can be found in Figure C- 1 and Figure C- 2.

Projecting transitions in vegetation states (i.e., composition and structure) over time facilitates the evaluation of each alternative considered. The vegetation states, and transitions from one state to another, can be visualized in a conceptual diagram. Figure C- 1 illustrates the conceptual diagram for the successional pathways of the Ponderosa Pine Bunchgrass ERU state-and-transition model. Boxes

[13] Characteristic vegetation is the vegetation composition and structure that would exist in a natural disturbance regime, and considered to be ecologically sustainable, and more resilient to climate change.

represent model states and arrows represent transitions due to natural growth and other natural and human factors such as management activities, fires, insects, and disease.

Figure C- 2 is a conceptual diagram for the historic state and transition model of the Semi-desert Grassland Mixed Native Vegetation ERU. Frequency of transitions are noted when this information is supported by published sources, where no information exists on the frequency of transitions the arrow is blank. Dashed outlines represent states which have crossed an ecological threshold. An example of ecological threshold is the box labeled “eroded condition” in Figure C- 2.

Table C- 7. VDDT state descriptions

State	Description
A	Grass, forb, shrubland; <10% canopy cover
B	Seeding/sapling, open; <10% canopy cover
C	Small trees, open; 10-30% canopy cover; 5-10” diameter class
D	Medium trees, open, single story; 10-30% canopy cover; 10-20” diameter class
E	Very large trees, open, single story; 10-30% canopy cover; 20+” diameter class
F	Seeding/sapling, closed; >30% canopy closure; 0-5” diameter class
G	Small trees, closed; >30% canopy closure; 5-10” diameter class
H	Medium trees, closed, single-story; >30% canopy closure; 10-20” diameter class
I	Very large trees, closed, single-story; >30% canopy closure; 20+” diameter class
J	Medium trees, open, multi-story; 10-30% canopy closure; 10-20” diameter class
K	Very large trees, open, multi-story; 10-30% canopy closure; 20+” diameter class
L	Medium trees, closed, multi-story; >30% canopy closure; 10-20” diameter class
M	Very large trees, closed, multi-story; >30% canopy closure; 20+” diameter class
N	Uncharacteristic state ; <10% canopy cover

VDDT models for ponderosa pine, mixed conifer, and pinyon juniper vegetation types (among others) were developed by the Forest Service at the regional level to be used specifically to compare alternatives for land management plans in the Southwestern Region. The actual data, databases, and spreadsheets that were used in this process are contained in the forest plan revision project record.

The Forest Vegetation Simulator (FVS) was used to calibrate STMs in Arizona and New Mexico. A standard set of silvicultural and fire transitions were evaluated using FVS simulations of Forest Inventory and Analysis plot data that have been grouped up by each Vegetation Dynamic Development Tool (VDDT) model state within each Potential Natural Vegetation Type (ERU). For example, if a stand that is in the medium-sized, closed canopy, single-story state were treated with group selection and free thinning followed by low-severity prescribed fire, it may go from 100 percent in the closed canopy, single-story state to 20 percent grass/forb/shrub; 5 percent very large, open, single-story; 50 percent medium, open, single-story; and 25 percent remaining in the original closed canopy, single-story state. A range of outputs from FVS (e.g., natural growth in the absence of disturbance, the probabilities of transitions to destination states resulting from natural and human events, harvest volumes, and vegetation characteristics such as carbon values) were captured and linked to transitions through the modeling framework. These outputs were used to evaluate the effects of vegetation management activities in the plan revision process (USDA Forest Service 2011h).

The Forest began with the models for Ponderosa Pine Bunchgrass (PPG) and Mixed Conifer with Frequent Fire (i.e., Mixed Conifer Dry or MCD) models. The PPG model was similar enough to the

Ponderosa Pine Gambel-Oak (PPO) model that the two were evaluated together as Ponderosa Pine Forest (PPF). A spreadsheet displaying a crosswalk of the ERUs and VDDT models is contained in the project record and it allows for user input of the percentage of PPG and PPO. Using FIA data collected across the forest over the past 10 years, it was estimated that PPO accounts for approximately 40 percent of the combined PPF type. The VDDT model provided a base comparison for the relative progress the plan alternatives are predicted to make toward desired conditions based on plan objectives. Much of the modeling response in VDDT was calibrated using FIA data inputs and results from FVS runs. In contrast to VDDT models, FVS can be more sensitive to management, because it models the fate of individual trees over time, rather than finite states of stand averages.

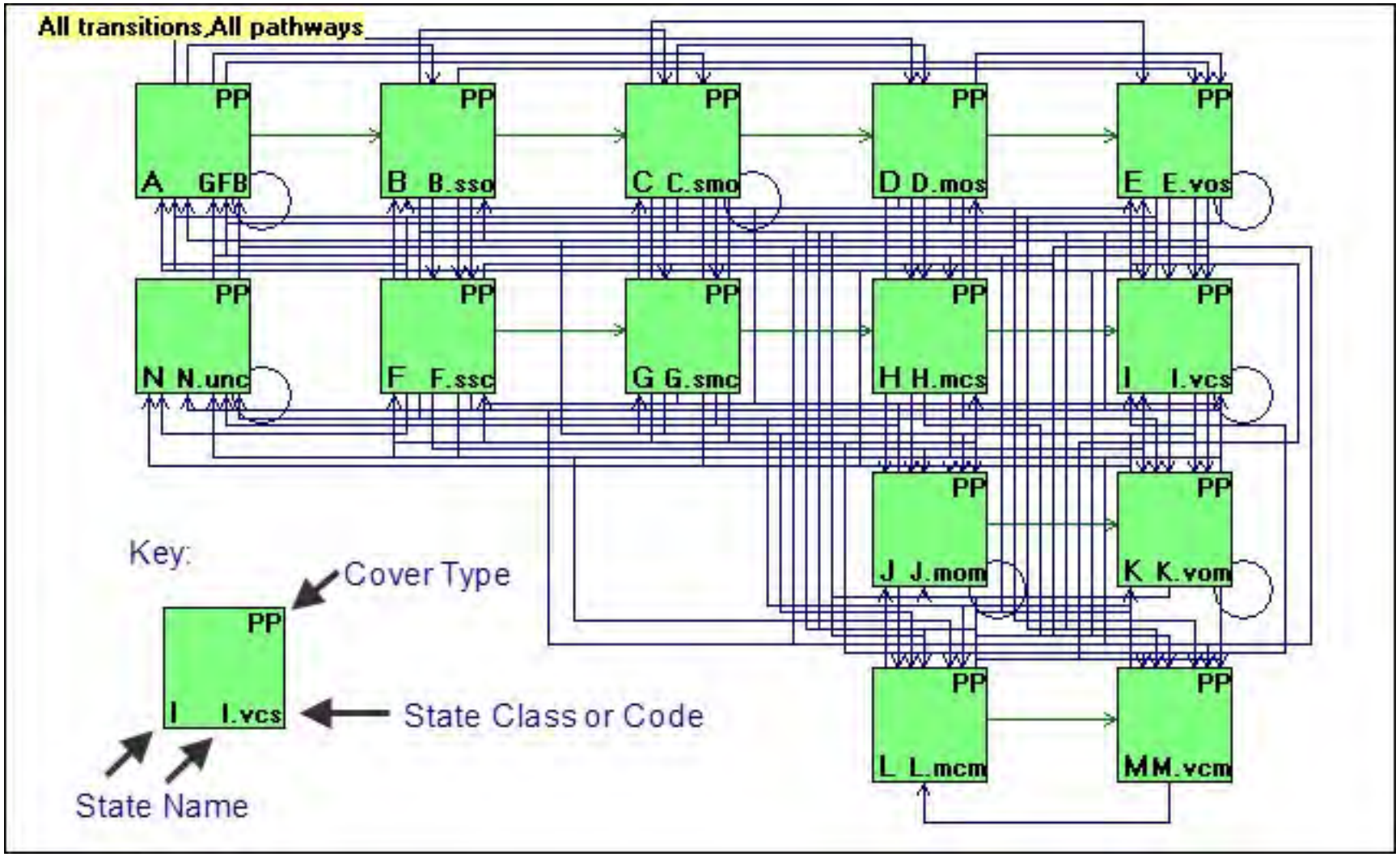

Figure C- 1. VDDT conceptual diagram for projecting transitions in vegetation states

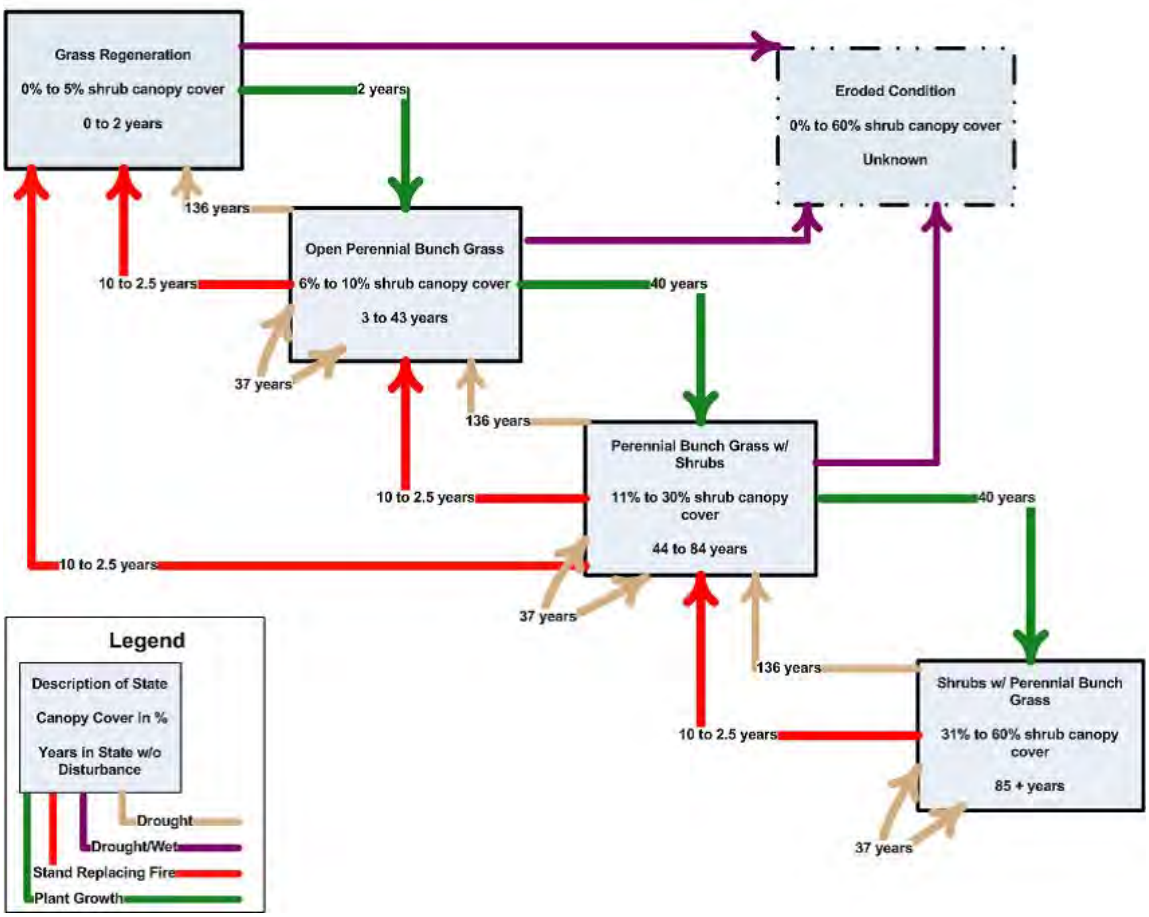

Figure C- 2. Conceptual historic State and Transition Model for the Semi-desert Grassland Mixed Native Vegetation Type

Each ecosystem has a standard set of vegetation states. Each vegetation state has a typical set of vegetation characteristics whose attributes can be defined by the FIA inventory plots that reside within the state (Miles et al. 2001). A standard set of potential natural and human events can occur within each state. These states and the effects of each event can be modeled with FVS simulations using the FIA plot data (Dixon 2002). Reports generated from FVS outputs can provide a variety of information by quantifying the following information by VDDT model state:

- The vegetation characteristics of each vegetation state. The probabilities of transitions to destination states resulting from:
    - ♦ natural growth in the absence of disturbance,
    - ♦ management activities, and
    - ♦ wildfire.
- The wood volumes and other outcomes resulting from each type of disturbance.

In the analysis process, the vegetation characteristics existing at any point in time for each modeled ERU are described by specific combinations of size, cover, and dominance type that are characteristic for each

ERU. For example, the combinations used to describe the vegetation states in the Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs are illustrated in Table C- 8 (USDA Forest Service 2011d).[14]

Table C- 8. Stratification of Ponderosa Pine and Mixed Conifer with Frequent Fire states A through N

Canopy Layering	Canopy Cover[1]	Grass Forb-Shrub	Trees 0-5" d.b.h.	Trees 5-10" d.b.h.	Trees 10-20" d.b.h.	Trees 20"+ d.b.h.
Single	Open	A or N[2]	B	C	D	E
Single	Closed		F	G	H	I
Multi	Open				J[3]	K[3]
Multi	Closed				L	M

[1] Except for states A and N, "open" states have 10 to 30 percent canopy cover and "closed" states have greater than 30 percent canopy cover. States A and N have less than 10 percent canopy cover.

[2] States A and N are grass, forbs, brush and shrub states. A is the characteristic state which existed in reference conditions. N is the uncharacteristic state resulting when stand-replacing fire occurs in closed canopy states.

[3] The desired condition is an open multi-layered ($\geq$ 5 age classes) state with average diameter varying by site productivity, state J occurring on less productive sites and state K on-sites with greater productivity.

The Forest Vegetation Simulator (FVS) (v2.02) along with the Fire and Fuels Extension (FFE) were used to simulate the effects of using fire as a restoration tool on various stand conditions. Only one fire cycle per stand was modeled, but each fire was modeled at low, moderate and high intensities. The comparative stand conditions from pre-modeled fire to post-modeled fire were then used as input to the Vegetation Dynamics Development Tool (VDDT). VDDT was used to model vegetation succession over the life of the forest plan and into the future, under the various proposed management alternatives. The current plan describes goshawk habitat in terms of Vegetation Structural Stage or VSS classes. Table C- 10 provides a crosswalk between VDDT model states, VSS class, and descriptions of northern goshawk habitat from Reynolds and others (Reynolds et al. 1992). Table C- 10 through Table C- 19 provide crosswalks between the state names used in the FEIS analysis and the more descriptive, qualitative state descriptors used in the analysis of alternatives along with proportions of each stated under reference (desired) conditions. These tables are located after the vegetation modeling assumptions.

Environmental conditions used to simulate the low, moderate, and high fire conditions are based on historic weather data from the Alpine Remote Automated Weather Station (RAWS). The Alpine RAWS has complete and accurate weather data. The data were sorted using Fire Family Plus (v4.1) to produce a Percentile Weather Report. This percentile report was used to determine the 15th, 75th and 90th percentile weather for the past 20 years (1990 to 2009). Weather data were used for a period from April 1 to October 15 each year, representing a typical fire season period. The 15th percentile represents natural fire season conditions for a low-intensity fire and the 75th percentile represents moderate and the 90th percentile the high-intensity fire conditions.

These percentiles of environmental conditions were used to represent both wildfires as well as prescribed fires. These environmental conditions approximate natural conditions under which a natural fire may burn and would be a good starting point for development of a management burning prescription. Winds generated from the report were unusually low, so 10, 15, and 20 mph winds were substituted for low, moderate, and high 20 mph winds. The percentile weather report does not produce an air temperature, so based on analysis of the weather data and professional judgment 60, 75, and 90 degrees were used, respectively. Duff moisture is also not produced by the percentile weather report. These were derived

[14] A more detailed explanation can be found in the manuscript Calibrating State and Transition Models with FVS: A Case Study (USDA Forest Service 2011d).

using FVS, FFE defaults for duff moisture under moist 125 percent, dry 50 percent, and very dry 15 percent conditions (USDA Forest Service and USDI 2008, p. 43). Varying duff moisture had little effect in the model on fire effects on stand conditions. These conditions were used across all vegetation types to provide consistency. A cooler and moister condition at higher elevation vegetation types compared to hotter and dryer lower elevation vegetation types was not significant in model outcome.

Ponderosa Pine, Mixed Conifer with Frequent Fire, Pinyon Juniper with Grass, Semi-desert Grassland, Great Basin Grassland, Montane/Subalpine Grassland were the only ERUs modeled.
Modeled outputs from the Vegetation Dynamics Development Tool (VDDT) were compared to existing and desired conditions. Evaluation criteria for whether an alternative is addressing the need for change in Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs are:

- Frequency of States[15] B and F combined. States B and F represent seedlings and saplings (0 to 5 inches d.b.h.). State B is open canopy (10 to 30 percent cover) and State F represents closed canopy (30 percent plus). These are both single-storied states. These represent conditions indicative of occasional even-aged stand dynamics and the development of closed mature forest habitat.
- Frequency of States C and G. State C represents small (5 to 10 inches d.b.h.), open canopy stands and Sate G represents small closed canopy stands. These represent conditions indicative of occasional even-aged stand dynamics and the development of closed mature forest habitat.
- Frequency of States D, E, J, and K combined. States J and K represent uneven-aged (multi-storied) conditions and dynamics with medium (10 to 20 inches d.b.h.) and very large (20 inches+ d.b.h.) open forests. States D and E represent even-aged (single-storied) conditions and dynamics with medium and very large open forests.
- This is based on reference conditions, and the predominance of uneven-aged dynamics and open forest condition. Stands on low-productivity sites are more likely to occur as state J, versus high-productivity sites where State K is more likely. Desired conditions are to have area primarily represented by J and K.
- Frequency of States H, L, I, and M combined. States L and M represent uneven-aged conditions and dynamics with medium and very large closed multiple-storied canopies. States H and I represent medium and very large closed single storied canopies.
- These conditions are indicative of mature closed forest habitat and occasional even-aged dynamics that occurred in the reference condition (Romme et al. 2009), particularly on north-facing slopes and canyons. Stands on low-productivity sites are more likely to occur as state H/L, versus high-productivity sites where State I/M are more likely.

Evaluation criteria for whether an alternative is addressing the need for change, in Pinyon Juniper with Grass are:

- Frequency of State A. States A represents grass, forb, and brush/shrub.
- Frequency of States B, E, and C combined.
    - State B is seedlings and saplings, single-storied, with open canopy.
    - State C is small trees, single-storied, with open canopy.
    - State E is very large trees, single-storied, with open canopy.

[15] A Description of Transitional States can be found in appendix C.

- Frequency of State D. State D represents grass, medium-sized trees, single-storied, with open canopy.
- Frequency of State F. State F represents seedlings and saplings, single-storied, with closed canopy.
- Frequency of State G. State G represents small trees, single-storied, with closed canopy.

Each modeled vegetation type would also be compared over time in terms of departure from reference conditions. All criteria are evaluated at the current, 15-year, and 50-year time-marks. Table C- 9 lists the quantitative projections and objectives developed for certain ERUs. Alternative A has no objectives, but projections were made for the number of acres likely to be treated. Acres listed are for each 10-year period following plan approval and assume treatments would be prioritized to move identified forest priority sixth code watersheds toward satisfactory conditions.

There are no objectives in any of the alternatives for the remaining vegetation types, recognizing the limited capacity for treatment during the planning period. This does not prevent treatments from being planned and implemented in these vegetation types as funding and personnel become available. Since there are no objectives for these vegetation types, no meaningful comparison of alternatives is possible using vegetation modeling. However, these ERUs will be evaluated qualitatively based on desired conditions, plan guidelines, and other plan components. Table C- 10 through Table C- 19 provide crosswalks between VDDT states and qualitative state descriptions for a variety of ERUs.

Table C- 9. Treatment projections or objectives for each 10-year period

ERU or Vegetation Type	Projection/Objective
Ponderosa Pine	**For all alternatives**: Use prescribed cutting to treat 50,000 to 260,500 acres of Ponderosa Pine during each 10-year period over the life of the plan.
Ponderosa Pine	**For all alternatives**: Use prescribed fire to underburn 150,000 to 200,000 acres of Ponderosa Pine within the natural fire regime during each 10-year period over the life of the plan.
Ponderosa Pine	**For all alternatives**: Use naturally ignited wildfires (i.e., lightning-caused fires that are managed for resource objectives) to treat 135,000 acres of Ponderosa Pine within the natural fire regime during each 10-year period over the life of the plan.
Mixed Conifer w/ Frequent Fire	**Alternative A:** Use prescribed cutting to treat 2,900 acres of Mixed Conifer with Frequent Fire during each 10-year period over the life of the plan. **Alternatives B (modified), C, and D:** Use prescribed cutting to treat 2,900 to 15,000 acres of Mixed Conifer with Frequent Fire during each 10-year period over the life of the plan.
Mixed Conifer w/ Frequent Fire	**For all alternatives**: Use prescribed fire on at least 8,000 acres of Mixed Conifer with Frequent Fire within the natural fire regime during each 10-year period over the life of the plan.
Mixed Conifer w/ Frequent Fire	**For all alternatives**: Use naturally ignited wildfires (i.e., lightning-caused fires managed for resource objectives) to treat at least 7,500 acres of Mixed Conifer with Frequent Fire within the natural fire regime, during each 10-year period over the life of the plan.

ERU or Vegetation Type	Projection/Objective
Pinyon Juniper w/Grass	**Alternative A:** Mechanically treat 1,000 acres of Pinyon Juniper with Grass during each 10-year period over the life of the plan. **Alternatives B (modified), C, and D:** Mechanically treat between 1,000 and 10,000 acres of Pinyon Juniper with Grass during each 10-year period over the life of the plan.
Pinyon Juniper w/Grass	**For all alternatives**: Use naturally ignited wildfires (i.e., lightning-caused fires that are managed for resource objectives) to treat at least 3,750 acres of Pinyon Juniper with Grass within the natural fire regime during each 10-year period over the life of the plan.
Pinyon Juniper Evergreen Shrub	**For all alternatives:** Use naturally ignited wildfires (i.e., lightning-caused fires that are managed for resource objectives) to treat at least 3,750 acres in Pinyon Juniper Evergreen Shrub within the natural fire regime during each 10-year period over the life of the plan.
Montane/Subalpine Grasslands	**Alternatives B (modified), C, and D:** Restore/enhance between 7,600 and 11,400 acres.
Great Basin Grasslands	**Alternative A:** Restore/enhance between 7000 acres. **Alternatives B (modified), C, and D:** Restore/enhance between 10,800 and 12,400 acres.
Semi-desert Grasslands	**Alternatives B (modified), C, and D:** Restore/enhance 3,500 acres.
Aspen and Maple	**Alternatives B (modified), C, and D:** Achieve 1,000 acres of aspen and maple restoration and maintenance.

Forest Openings

Forest lands are areas which currently have at least 10 percent tree canopy cover or have demonstrated the ability of sustain at least 10 percent tree canopy cover at maturity (USDA Forest Service 2014). They have different characteristics (e.g., soils) from grasslands and meadows that may be adjacent to and sometimes within forested landscapes. To be considered a forest opening, an area must meet the following two criteria:

> a) the forest land must currently have less than 10 percent canopy cover (any appropriate method, such as algorithmic relationships, growth simulators, remote sensing, or direct measurement, may be used to determine existing canopy cover [for example figure C-3]) and
>
> b) the forest land must have the site capacity but an insufficient number of established seedlings (or larger trees) to sustain at least 10 percent tree canopy cover at maturity (any appropriate method, such as algorithmic relationships and growth simulators, may be used to determine the number of established seedlings required to achieve 10 percent canopy cover at maturity based on post-treatment stocking and seedling growth).

For example, ponderosa pine reaches its earliest state of maturity at approximately 60 years; though this species bears cones as early as 7 years, the seeds are most viable between the ages of 60 and 160 (Oliver and Ryker 1990). The Forest Vegetation Simulator (FVS) was used to calculate the minimum number of mature pines that would be required to attain a canopy cover level of 10 percent. Based on the FVS model outcomes, it was determined that 10 percent canopy cover can be achieved by a minimum of 39 mature (60 years old and at least 8.9 inches d.b.h.) ponderosa pines per acre. If an area of forest land has demonstrated that it can sustain 10 percent tree canopy cover when mature and an average of at least 39 established seedlings remain after harvest, then the area is not an opening. The number of seedlings may be less if other trees that contribute to canopy cover are also left after harvest.

In another example, an algorithmic relationship between canopy cover and basal area (Shepperd et al. 2002) was also used to determine the minimum number of mature ponderosa pine that would be required to maintain at least 10 percent tree canopy cover (Figure C-3). The minimum number of trees required depends on the average diameter of the residual trees. Larger trees have larger canopies and as such, fewer large trees would be required for the area to be considered forest. If sufficient trees of the appropriate size are present, then the area is not considered an opening. If other trees that contribute to canopy cover are present, such as oak and aspen, the required stocking would be lower.

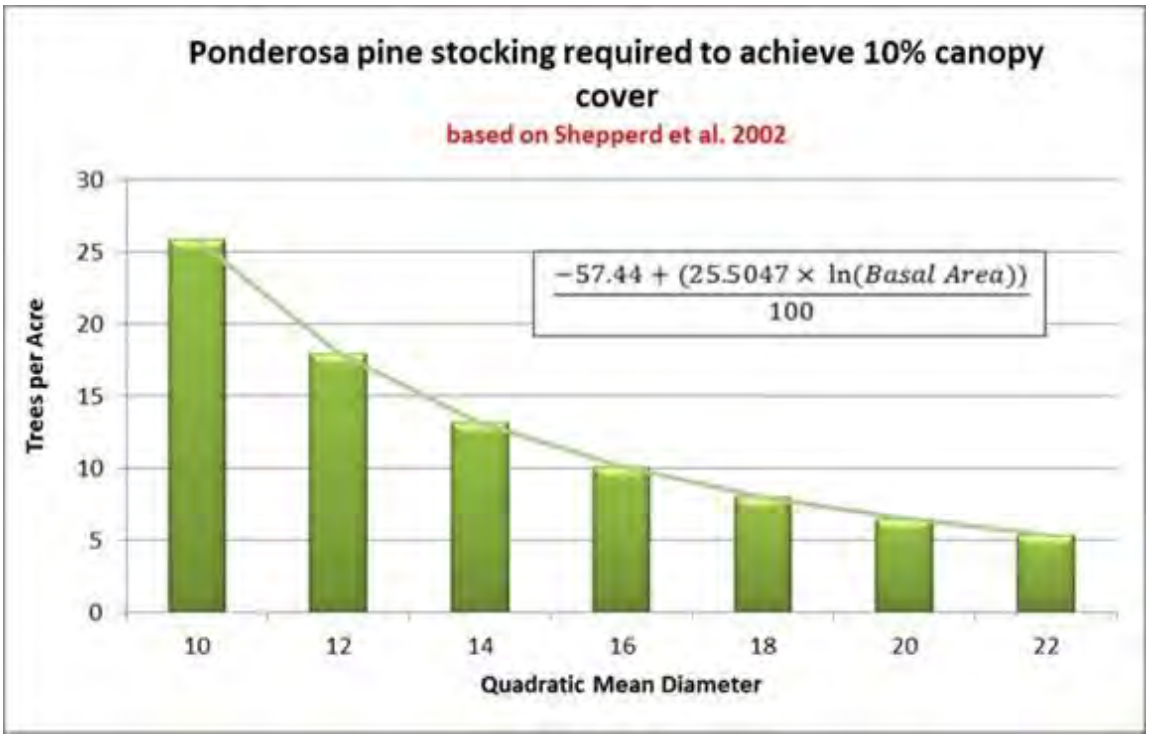

Figure C- 3. Minimum stocking of various sized trees required to sustain 10 percent canopy cover

Table C- 10. Crosswalk between model states for Ponderosa Pine Forest and the Mixed Conifer with Frequent Fire ERUs and vegetative structural stages in the 1987 plan

Name	Code	Description	Tree Size Class Break in Inches	Story	Tree-Shrub Canopy Cover percent	Approx. VSS	RM-217 Description
A	GFB/ SHR	Grass, Forb, Brush/Shrub	NA	NA	0 – 10	VSS1	<1" d.b.h. Grass, Forb, Shrub (opening)
B	SSO	Seedling, Sapling, Open	0 – 5	Single	10 – 30	VSS2	1-4.9" d.b.h. Seedling, sapling
C	SMO	Small, Open	5 – 10	Single	10 – 30	VSS3	5-11.9" d.b.h. Young Forest
D	MOS	Medium, Open, Single story	10 – 20	Single	10 – 30	VSS4	12-17.9" d.b.h. Mid-age Forest
E	VOS	Very-large, Open, Single story	20 plus	Single	10 – 30	VSS5&6	18"+ d.b.h. Mature and Old Forest

Name	Code	Description	Tree Size Class Break in Inches	Story	Tree-Shrub Canopy Cover percent	Approx. VSS	RM-217 Description
F	SSC	Seedling, Sapling, Closed	0 – 5	Single	30 plus	VSS2	1-4.9” d.b.h. Seedling, sapling
G	SMC	Small, Closed	5 – 10	Single	30 plus	VSS3	5-11.9” d.b.h. Young Forest
H	MCS	Medium, Closed, Single story	10 – 20	Single	30 plus	VSS4	12-17.9” d.b.h. Mid-age Forest
I	VCS	Very-large, Closed, Single story	20 plus	Single	30 plus	VSS5&6	18”+ d.b.h. Mature and Old Forest
J	MOM	Medium, Open, Multiple story and Uneven Aged	10 – 20	Multiple story and uneven aged	10 – 30	VSS4	12-17.9” d.b.h. Mid-age Forest
K	VOM	Very-large, Open, Multiple story and uneven aged	20 plus	Multiple story and uneven aged	10 – 30	VSS5&6	18”+ d.b.h. Mature and Old Forest
L	MCM	Medium, Closed Multiple story	10 – 20	Multiple story and uneven aged	30 plus	VSS4	12-17.9” d.b.h. Mid-age Forest
M	VCM	Very-large, Closed, Multiple story	20 plus	Multiple story and uneven aged	30 plus	VSS5&6	18”+ d.b.h. Mature and Old Forest
N	GFB/ SHR	Grass, Forb, Brush/Shrub	N/A	N/A	0 – 10	VSS1	<1” d.b.h. Grass, Forb, Shrub (opening)

Table C- 11. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Interior Chaparral ERU

State (VDDT Model)	State (Qualitative)	Reference Percent Composition	Description, Size, and Cover Class
A	Early: grass, forb	2	Recently burned, sparsely vegetated, and all corresponding herb types
B	Early-mid: grass, shrub	5	Grass and Shrub-Open All corresponding shrub types
C, D	Mid-Late: dense shrub, no understory	93	Dense shrub-closed AND all tree size and cover classes

Table C- 12. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Semi-desert Grassland ERU

State (VDDT Model)	State (Qualitative)	Reference Percent
A	Grass forb regeneration	24
B	Open perennial bunchgrass	76
C	Perennial bunchgrass w/shrubs and trees, open canopy	0
D	Shrubs and trees w/perennial bunchgrasses	0

Table C- 13. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Great Basin Grassland ERU

State (VDDT Model)	State (Qualitative)	Reference Percent
A	Early development – recently burned, sparsely vegetated, open canopy	5
B	Mid development – grass, forbs, open canopy	70
C	Late development – open; some shrubs, seedlings and saplings and some mid-size trees	20
D	Mid development – some very large shrubs, closed canopy and some very large trees, open canopy	5

Table C- 14. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Montane Subalpine Grassland ERU

State (VDDT Model)	State (Qualitative)	Reference Percent
A	Early development, open canopy (herbaceous vegetation)	20
B/C	Mid development, open canopy (herbaceous vegetation)	80
D	Late development, closed canopy (trees, shrubs and herbaceous vegetation)	0

Table C- 15. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Pinyon Juniper ERUs

State (VDDT model)	State (Qualitative)	Reference Percent PJ Evergreen Shrub	Reference Percent PJ Woodland (Persistent)	Reference Percent PJ with Grass	Size and Cover Class
A	Early Development	5	10	5	Recently burned, grass, forb, and shrub types
B, E, C	Mid-Open	55	5	25	Seed/sap-open Seed/sap-closed Small-open
D	Late-Open	40	10	50	Medium-open, very large-open
F	Mid-Closed	0	15	10	Small-closed
G	Late-Closed	0	60	10	Medium-closed, very large-closed

Table C- 16. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Ponderosa Pine ERU

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
A, N	Early Development	0	Recently burned, grass, forb, and shrub types

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
B, F	Early forest	1.4	**Seed/sap-open** **Seed/sap-closed** Conditions indicative of occasional even-aged stand dynamics and the development of closed mature forest habitat. Greater than 10 percent tree cover.
C	Young forest	1.4	**Small-open** Conditions indicative of occasional even-aged stand dynamics and the development of closed mature forest habitat. Less than 30 percent cover.
D, J, E, K	Mid-age forest Mature/old forest with regeneration	88	**Medium-open** (even and uneven-aged) **Very Large-open** (even and uneven-aged) Based on reference condition, and the predominance of uneven-aged dynamics and open forest. The plurality of stands on low-productivity sites likely to occur as Medium-open/uneven-aged, versus high-productivity sites where Very large-open/uneven-aged is more likely. Less than 30 percent cover.
G	Young forest	1.4	**Small-closed** Conditions indicative of occasional even-aged stand dynamics and the development of closed mature forest habitat. Greater than 30 percent cover.
H, L, I, N	Mid-age forest Mature/old forest with regeneration	7.8	**Medium-closed** (even and uneven-aged) **Very Large-closed** (even and uneven-aged) Conditions indicative of mature closed forest habitat and occasional even-aged dynamics that occurred in the reference condition (Romme et al. 2010), particularly on north facing slopes and canyons. The plurality of stands on low-productivity sites likely to occur as Medium-closed, versus high-productivity sites where Very large-closed is more likely. Greater than 30 percent cover.

Table C- 17. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for Mixed Conifer with Frequent Fire ERU

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
A,N, B, F	Early Development, all structures	9	**Seed/sap-open** **Seed/sap-closed** Recently burned, grass, forb, and shrub types, and conditions indicative of even-aged stand dynamics and the development of MSO habitat.
C	Mid development, open	3	**Small-open** Reference condition, and conditions indicative of even-aged stand dynamics and the development of MSO habitat.
D, J, E, K	Late development, open	60	**Medium-open** (even and uneven-aged) **Very Large-open** (even and uneven-aged) Based on reference condition, and the predominance of uneven-aged dynamics and open forest. The plurality of stands on low-productivity sites likely to occur as Medium-open/uneven-aged, versus high-productivity sites where Very large-open/uneven-aged is more likely.

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
G	Mid development, closed	3	**Small-closed** Reference condition, and conditions indicative of even-aged stand dynamics and the development of MSO habitat.
H, L, I, N	Late development, closed	25	**Medium-closed** (even and uneven-aged) **Very Large-closed** (even and uneven-aged) Conditions indicative of mature closed forest habitat and occasional even-aged dynamics that occurred in the reference condition (Romme et al. 2010), particularly on north-facing slopes and canyons. The plurality of stands on low-productivity sites likely to occur as Medium-closed, versus high-productivity sites where Very large-closed is more likely.

Table C- 18. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Mixed Conifer with Infrequent Fire ERU

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
A	Early Development	7	Recently burned, Grass/forb with aspen or oak ramets, 10 to 40 percent tree cover.
B	All aspen, and evergreen-deciduous mix tree types	21	**Seed/sap, small, medium, and very-large - all cover classes.** Aspen/mixed-aspen forest, greater than 40 percent tree cover, dominated by aspen or oak, conifer understory.
C, G	Early, Mid development-	18	**Seed/sap, small - all cover classes** **Seed/sap-open, small-open** Mixed conifer forest with regeneration, 20 to 60 percent+ tree cover (shade-intolerant trees).
D, H	Mid, Late Development	14	**Medium - all cover classes** Mixed conifer forest with regeneration, 20 to 60 percent+ tree cover (shade-intolerant, intermediate, and tolerant trees).
E, F	Late Development - closed	40	**Very Large-closed** Mixed conifer old forest with regeneration, 20 to 60 percent+ tree cover. Higher proportions can be expected for associations with longer stand-replacement intervals (shade-intolerant and tolerant trees).

Table C- 19. Crosswalk between VDDT states and qualitative state descriptions used in alternative analysis for the Spruce-Fir ERU

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
A	Early Development	9	Grass/forb seedling/sapling with aspen, Douglas-fir, spruce, fir. 10 to 40 percent tree cover.
B	Early Forest	13	**Seed/sap, small, medium, and very-large - all cover classes.** Grass/forb seedling/sapling with aspen, Douglas-fir, spruce, fir. Aspen/mixed-aspen, 0 to 10 percent.

State (VDDT Model)	State (Qualitative)	Reference Percent	Description, Size and Cover Class
C, G	Early, Mid development-	22	**Seed/sap, small - all cover classes** **Seed/sap-open, small-open** Conifer early forest, 10 to 20 percent. Grass/forb seedling/sapling with aspen, Douglas-fir, spruce, fir. Aspen/mixed-aspen early forest, 0 to 10 percent. (Shade intolerant, intermediate, and tolerant trees.)
D, H	Young forest with regeneration	15	**Medium - all cover classes** (Shade-intolerant, intermediate and tolerant trees)
E, F	Mature/old forest with regeneration	44	**Very Large-closed** Mature/old forest with regeneration (shade-intolerant and tolerant trees).

Fire Regime

Fire-adapted ecosystems are those that have evolved with wildfire as a natural disturbance agent and where wildfire plays an essential role creating and maintaining the structure, composition, and function (Bond and Keeley 2005). In order to evaluate the current fire regime in fire-adapted ERUs, we compared historic to current fire return intervals and severity to quantify the differences in fire disturbance patterns and how that relates to ecosystem process and function (Allen 1996) using fire regimes.

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse-scale definitions for natural fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes are found throughout the forest:

- **I** – 0 to 35-year frequency and low (surface fires most common) to mixed severity (generally less than 25 percent of the dominant overstory vegetation replaced by low severity fire, up to 75 percent of the dominant overstory vegetation replaced by mixed severity fire);
- **II** – 0 to 35-year frequency and high (stand-replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- **III** – 35 to 100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- **IV** – 35 to 100+ year frequency and high (stand-replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- **V** – 200+ year frequency and high (stand-replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced).

Fire Regime Condition Class/Vegetation Condition Class

Initially, Fire Regime Condition Class (FRCC) was used in the Ecological Sustainability Report to characterize the combination of vegetation condition departure and fire regime departure relative to the reference condition (Hann and Bunnell 2001, Hardy et al. 2001, Hann et al. 2004). It was subsequently determined that FRCC does not adequately quantify key fire regime attributes or address the ecological

role of fire.[16] What was referred to as FRCC in 2009 is now more accurately called vegetation condition class (VCC) and represents the level of departure of the composition and structure of the vegetation relative to the historic conditions.[17]

For consistency, the FRCC values were retained, but renamed VCC and were paired with fire return intervals. Within this analysis, VCC 1 (low) is represented by vegetation departure ratings 0 to 33, VCC 2 (moderate) is 34 to 66, and VCC 3 (high) is 67 to 100. The departure ratings are from LANDFIRE and describe the current condition, but they cannot be used to predict trends in departure. The VDDT analysis expands on the initial VCC assessment by quantifying the type of departure and predicting trends under various management scenarios. The methods to predict fire return interval departure and trend are summarized below.

For frequent-fire systems, vegetation in VCC I (low departure) is more resistant and less likely to lose key ecosystem components (e.g., native species, large trees, soil) after a disturbance. Fire behavior and other associated disturbances are similar to those that occurred prior to fire exclusion. For example, Ponderosa Pine in VCC I would have a vegetative structure similar to historic conditions when fires were generally high frequency low-intensity surface fires and vegetation consisted of all-aged open stands and clumps of trees. This is considered to be within the historic range of variability.

Vegetation in VCC II and VCC III is moderately to highly altered or departed, from historic conditions (e.g., denser, less open, fewer age classes, and fewer clumps). Two scenarios are possible when vegetation is highly departed. First, the intensity, severity, and extent of fires can be altered because of changes in vegetation conditions. Second, an ERU may no longer have the requisite components to carry characteristic fires. An example of the latter is the Pinyon Juniper with Grass ERU. In this ERU, fire exclusion has resulted in so many missed fires that an overabundance of trees has become established. Canopy closure increased as tree density increased and this has reduced the abundance and vigor of understory vegetation. Consequently, under the current condition, surface fire can no longer be carried by the understory since the grass layer is no longer present. This condition encourages the establishment of more trees and closed canopy conditions. Changes like this would be most pronounced in frequent fire ERUs where disruption of fire return intervals has resulted in higher departures.

Under the first scenario, the risk of uncharacteristic fires increases. Under the second scenario, the ability to carry fire would be reduced. In vegetation types where the disruption of fire disturbance is closer to reference conditions, the environmental consequences of fire exclusion are not as great and, therefore, are not as likely to produce uncharacteristic fires. Under reference conditions, ERUs would be more resilient to disturbances, fire would be self-regulating, and would maintain fire intensity and severity more consistently.

Fire Return Interval Departure and Trend

With the exception of the Desert Communities, Alpine Tundra ERUs and riparian areas, the remaining terrestrial ERUs are fire-adapted. While VDDT models, which are used to predict changes to vegetation and structure, contain elements related to fire disturbance, the primary focus is on vegetation. These models do not fully capture the effects of fire, and yet there is no surrogate for the fire process; it is critical to ecosystem function and the ecological restoration of fire-adapted ERUs. In an effort to address the ecological importance of the fire process, we also analyzed the fire return interval of each ERU. Fire

[16] It did not include the two primary fire regime factors (departure from historic frequency and severity) that are required to calculate FRCC as defined by Hann and Bunnell (2001).

[17] The forest desired conditions are similar but not equal to historical conditions for Ponderosa Pine, Mixed Conifer with Frequent Fire, and Mixed Conifer with Infrequent Fire, given management considerations for Mexican spotted owls and northern goshawks. This is important because FRCC describes how departed a system is from historical conditions, not from desired conditions.

Return Interval (FRI) departure state and trend predictions, current and at 50 years, were made to ensure that the fire process is adequately taken into account in determining the state of our ERUs. Estimating FRI departure is not intended to equate to restoring fire regime, it is simply a subset of the fire regime. However, restoring the FRI would be an important step toward fire restoration. The ERUs historic FRI (HFRI) is the basis for making FRI departure state and trend predictions. For example, a frequent fire ERU would require frequent fire for that ERU to have a low departure state or "moving toward" trend. FRI departure states are qualitatively rated similar to VCC (low, moderate, or high departure).

The FRI departure state of an ERU was determined by comparing the HFRI to the current FRI derived from the Ecological Sustainability Report (USDA Forest Service 2009b) or based on updated information for each ERU. The predicted FRIs based on various management scenarios are estimated in light of fire cessation (determined to be around 1870 on the Coconino NF). For example, predicted fire treatments in years 2020 and 2030 may result in a single FRI of 10 years; however, when considering how this would impact an ERU's movement from one FRI state to another (from high to moderate for example), the previous 150 years without fire must also be taken into account. So, in the previous example, while a single 10-year FRI has occurred, the more accurate FRI would be approximately to 75 years (150 years/2 fires).

Large deviations between an ERU's current FRI and the HFRI would result in a high FRI departure state. If the current FRI and the HFRI are the same, the result is a low FRI departure state. Current FRIs near the upper end of an ERU's HFRI would result in moderate FRI departure state. Where current FRI values are unavailable in the ESR, estimates were made based on the best available information. Generally, elevation and state of adjacent ERUs were considered in these cases.

Trends for fire return intervals were determined differently for Ponderosa Pine and Mixed Conifer with Frequent Fire than other ERUs, because the majority of fire treatments are expected to occur in these two ERUs and there are plan objectives that propose treating a substantial proportion of each ERU with prescribed fire. The predicted fire return interval is determined by taking the forestwide acreage of an ERU and dividing it by the predicted annual fire treatment acreage (provided by plan objectives in each alternative). This value was then evaluated to relative to the ERU's HFRI. The predicted annual acreage of wildfires managed for resource objectives is dependent on many factors beyond the control of managers (such as other management direction, the agency's National Fire Policy, or environmental conditions). The actual treated acres could be less than predicted. In this case, progress toward desired conditions for FRI could be slower than predicted or may actually trend away from desired conditions. If more acres are treated than predicted, progress toward desired conditions could be faster.

There have been dozens of fire history studies on Ponderosa Pine in Arizona and New Mexico and they have demonstrated the fire return intervals vary across the region, ranging from 1 to 25 years (Allen 1996). The Coconino NF has historically had more forest fires than any other forest in the Southwest Region. Accordingly, this analysis uses a fire return interval range of 2 to 14 years to the Coconino NF.

As an example of this method, the trend for ponderosa pine was determined as follows. There are about 800,000 acres of Ponderosa Pine forestwide. Therefore, forestwide fire treatment level of 100,000 acres per year of Ponderosa Pine would result in an 8-year FRI and a commensurate FRI departure trend toward reference conditions. A forestwide 52,000 acres per year Ponderosa Pine fire treatment level would be at the upper end of the natural FRI (about 15 years) and result in a slower FRI trend toward reference conditions, but would never actually attain the desired condition. Each additional fire treatment occurring at 15-year intervals brings the predicted FRI closer to the HFRI. However, once the FRI reaches 15 years, it would still be higher than is desired to adequately restore the fire process and ecosystem function (see the assumptions section for more information).

Based on this approach and the proposed plan objectives (treat between 150,000 to 200,000 acres with prescribed fire and 135,000 acres with wildfires managed to meet resource objectives over 10 years), the predicted fire return interval trend for the ponderosa pine ERU is toward desired conditions, but at a slow rate. However, the only reason Ponderosa Pine moves toward reference conditions rather than having a static trend is because it is currently at a 344-year FRI so any reduction in interval moves the ERU in the right direction. The predicted FRI departure would remain high for the next 50 years. At the levels described in the objectives, treatments would not be sufficient to lower the FRI departure to a moderate state within the analysis timeframe.

For all fire-adapted ERUs except Ponderosa Pine and Mixed Conifer with Frequent Fire, a different method was used to determine FRI trend. The primary reasons for the difference in approach are the lack of historic fire treatments forestwide in these ERUs and the very limited (or nonexistent) treatment objectives under the proposed alternatives. In these ERUs, the current FRI is derived from the ESR (USDA Forest Service 2009a). Where current FRI values could not be derived from the ESR, informed estimates were made. The current FRI, historic fire treatments, and anticipated fire treatments were cumulatively compared to the ERU's HFRI. If the predicted FRI (taking into account the historic fire exclusion period) is greater than the HFRI, but the predicted short-term FRI is similar to the HFRI, then the trend is improving and, is thus, moving toward desired conditions. If both the HFRI and the predicted FRI (including the fire exclusion period) are similar, then the result is a static trend. If the predicted short-term FRI is larger than the HFRI, the result is a trend away from desired conditions. For example, Great Basin Grasslands had an HFRI of 0 to 35 years and a current FRI of 500+ years. Therefore, it is in high FRI departure state. Given the lack of fire treatment objectives in the current plan (0 acres in 10 years) and its history of few acres treated by fire (less than 1,300 acres of prescribed fire in 10 years and less than 1,300 in 10 years of wildfires managed for resource objectives), the FRI is trending away from desired conditions.

Likelihood to Suppress Wildfires

The decision to suppress a wildfire rather than managing it for resource objectives depends on a number of site-specific factors including some that can change over time. Some of the factors that can influence this decision include: the location of the ignition relative to the surrounding topography, the proximity of the fire to communities and infrastructure, the direction and strength of the prevailing winds, and surface fuel moisture.

The effects of these and other factors on the likelihood to suppress wildfires fall on spectrum. For example, the closer a wildfire is to a community or other vulnerable infrastructure, the greater the likelihood of suppression. Similarly, the stronger the prevailing winds, the greater the chance of having active crown fire and the greater the likelihood of suppression. All of these factors and others are taken into consideration at the time and the outcome cannot be determined in advance.

In some cases, plan direction, laws, or policies can also influence the likelihood of a decision to suppress wildfires. For example, under the current forest plan, managing wildfires for resource benefit within the wildland-urban interface is prohibited. As another example, in designated wilderness areas where the available tools for managing wildfires are limited by law (e.g., vehicles and chainsaws are prohibited), the likelihood that a fire will be managed to meet resource objectives is less because of both the difficulty of maintaining and controlling wildfires within desired areas while using a limited toolset and the greater risk to firefighter safety. However, fire treatments are desirable in fire-adapted ERUs and depending on environmental conditions at the time and the location of the wildfire, suppression may not be the final decision, even in wilderness.

When evaluating the consequences of recommending wilderness areas or establishing new special areas (such as research natural areas and geological and botanical areas), the effect on the likelihood of

managing wildfires for resource objectives is considered. In general, when the likelihood of managing wildfires for resource objectives declines, the number of opportunities to use this type of fire treatment declines commensurately. It is expected that as the number of opportunities for fire treatment declines, the proportion of the landscape that will be restored over the analysis period will also be less. This could have a direct impact on the progress toward desired conditions for fire-adapted ERUs.

Assumptions for Fire

In the analysis for fire, additional assumptions were made:

- There is no surrogate for burning; it is critical to ecological restoration.
- Fire-adapted ERUs have been without fire for about 130 years; therefore, movement toward historic fire return intervals will take time.
- An ERU moves toward desired condition if its predicted FRI is less than its current FRI.
- Although an ERU moves toward desired conditions as described above, a predicted FRI range near midpoint of an ERU's HFRI is desired for effective fire restoration (to move toward restoring ecosystem function).
- HFRIs were estimated by evaluating the HFRI distributions in RM-GTR-286 (Allen 1996). The midpoint was simply estimated to be the midpoint of a commonly accepted HFRI range. For example ponderosa pine, has a range of 2 to 14 years, so the midpoint is 8 years.
- Movement toward desired conditions (i.e., to a "better" state or lower departure from a high to moderate departure) requires:
    - A predicted FRI close to an ERU's HFRI for many cycles is required to move to a low departure state. Mechanical and fire treatments may be required to adequately alter forest structure.
    - Predicting future fire return intervals assumes that different areas are treated each year. For example, a 10,000-acre annual treatment would occur in different areas each year and result in 100,000 acres being treated in 10 years.

Wildland-urban Interface

Because there are several definitions of wildland-urban interface (FSM 5140.5, HFRA, Wisconsin), an explicit line on a map is insufficient. Therefore, wildland-urban interface is discussed further to emphasize the importance of treatment prioritization to protect associated values while acknowledging that "wildland-urban interface line" (in terms of threat or risk) moves as conditions change across the landscape. For illustrative purposes, the highest priority would be termed "intensive" wildland-urban interface.

First, the concept of "societal value" of a feature or value and its impact on the wildland-urban interface is important to understanding the definition of wildland-urban interface. Some features are extremely important to our communities. How difficult it is to replace these values, if lost, is also considered here (see Figure C- 4). For example, water supplies, transportation and communication infrastructure are on the most intensive end of the wildland-urban interface spectrum.

Least Intensive	<---------	---------->	Most Intensive
Low societal value, common and easy to replace.			High value, loss leads to hardship, rare and not replaceable

Figure C- 4. Illustration of wildland-urban interface regarding "societal values"

Second, the concept of the distance of fire to values follows. This refers to the distance of values from locations on the forest (see Figure C- 5). For example, a fire located 10 miles from a given value compared to the same fire 1 mile from the same value.

Least Intensive	<----------	---------->	Most Intensive
Many miles from values			Adjacent to values

Figure C- 5. Illustration of wildland-urban interface regarding "distance to values"

Third, the concept of juxtaposition of fire (relative to predominant winds) to values follows. This refers to the location, regardless of distance, of values relative to predominant wind direction (see Figure C- 6). The idea considers that most fires on the forest have potential to spread rapidly to the northeast given predominant southwest winds. For example, a given fire located 2 miles southwest of a value would be more intensive wildland-urban interface relative to a fire located 2 miles northeast of the same value.

Least Intensive	<----------	---------->	Most Intensive
Northeast of values			Southwest of values

Figure C- 6. Illustration of wildland-urban interface regarding "juxtaposition" and typical fire spread

Lastly, the concept of seasonal conditions and fire behavior potential follows. This refers to the fire behavior potential that varies as conditions change. For example, regardless of societal value, distance, and juxtaposition, the conditions of the fuels (flammability) impact the "intensiveness" of wildland-urban interface (Figure C- 7). Generally, during the most extreme fire danger (historically around the end of June), the most intensive wildland-urban interface extends a great distance. Similarly, the wildland-urban interface line moves closer to the values when the forest has low fire danger (that is., snow in the winter).

Least Intensive		---------->	Most Intensive
Snow-covered, wet fuels - circa Winter Solstice	<----------		Extremely dry fuels- circa Summer Solstice

Figure C- 7. Illustration of wildland-urban interface regarding "seasonal flammability" and fire behavior potential

Climate Change

Each resource within the Coconino NF was analyzed with the awareness that natural ecosystems are regulated by climate, and climate is to some degree determined by natural ecosystems. With the awareness and indicators of climate change currently emerging across each resource, monitoring and management direction will be dynamic through the life of the revised plan.

Assumptions for Climate Change

- Resource area assumptions are consistent with the regional policies described in Southwestern Region Climate Change Trends and Forest Planning (USDA Forest Service 2010c). While many factors influence climate in the Southwest during a particular year or season, predictable patterns hold across the years and decades to define the region's climate.
- The overall aridity relates to a global circulation pattern known as Hadley circulation, which creates a semi-permanent high-pressure zone over the Southwest.
- Relatively high temperatures with dynamic daily swings define this geographic region.
- Mountains and other differences in elevation affect local climate patterns.
- The North American monsoon works to bring moisture from the tropics into the region during the summer months.

Based on Multi-Model ensemble climate models, by the end of the century, the Southwest is likely to experience:

- Temperature increases of 5 to 8 degrees Fahrenheit.
- An increase in the number of extremely hot days, with summer heat waves lasting 2 weeks or longer.
- Warmer winters and reduced snowpack, and a later monsoonal season.
- A 5 percent drop in precipitation in most of Arizona and New Mexico; possible 10 percent drop in southern Arizona.
- An increase in extreme flood events following an overall increase in tropical storms.
- Projected decreases in precipitation, reduced snowpack, and overall water availability.
- Increased risk from wildfire, insects and disease, invasive species.
- Potential decrease in ecosystem productivity from water limitations and increased heat.
- Potential impacts to alpine, riparian, wetland, sky island, and aquatic habitats.

Climate modeling is a developing science

- Newer multi-model ensembles are "better than the sum of their parts," and are used increasingly for projecting climate change in the Southwest.
- Downscaling techniques, including Statistical Downscaling, Dynamical Downscaling, and Sensitivity Analysis, are improving.
- Regional Modeling, which incorporates jet stream activity, tropical storm and monsoon tracking, and regional elevation effects, has a high potential to improve localized climate projections.
- As yet, there are no reliable climate models at the forest scale.

Climate and southwestern ecosystems

- Projected decreases in precipitation, reduced snowpack, and overall water availability.
- Increased risk from wildfire, insects and disease, and invasive species.
- Potential decrease in ecosystem productivity from water limitations and increased heat.
- Potential impacts to alpine, riparian, wetland, sky Island, and aquatic habitats.

Recreation

Developed and Dispersed Recreation and Special Uses

The recreation opportunity spectrum (ROS) provides a framework which allows administrators to manage and users to enjoy a variety of recreation environments. ROS is not a land classification system; it is a management objective, a way of describing and providing a variety of recreation opportunities (USDA Forest Service 1982b). The references for this section are located in Volume 2 of the FEIS.

The ROS provides a framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences have been arranged along a spectrum divided into six classes shown in Figure C- 8. The names of the classes are descriptive to provide utility in land management planning and other applications. Each class is defined in terms of its combination of activity, setting, and experience opportunities (USDA Forest Service 1990). The black wedge in the figure represents the level of site development and social encounters, which increase from left to right. The spectrum describes a range of recreation opportunities, from a very high probability of solitude, self-reliance, challenge, and risk (that is, primitive) to highly developed environments where self-reliance, challenge, and risk are relatively unimportant (rural or urban) (USDA Forest Service 1986).

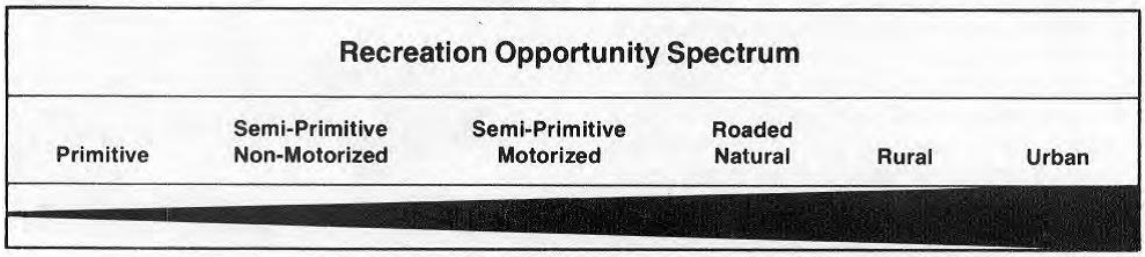

Figure C- 8. Recreation opportunity spectrum classes (USDA Forest Service 1986, II-30)

The basic assumption underlying the ROS is that quality in outdoor recreation is best assured through provision of a diverse set of opportunities. Providing a wide range of settings varying in level of development, access, and other factors, insures the broadest segment of public will find quality recreational experiences, both now and in the future. Although the notion of quality is relative—a value judgment—the concept of quality can be stated for management decision purposes in this way: quality depends on what experiences the individual is looking for, how much of it is realized, and the degree of satisfaction (USDA Forest Service 1990).

A recreation opportunity setting is defined as the combination of physical, biological, social, and managerial conditions that give value to a place. Thus, an opportunity includes qualities provided by nature (vegetation, landscape, topography, scenery), qualities associated with recreational uses (levels and types of use), and conditions provided by management (developments, roads, regulations). By combining variations of these qualities and conditions, management can provide a variety of opportunities for recreationists (USDA Forest Service 1990).

Throughout the range of alternatives there are three different methodologies used for delineating ROS classes. Mapping of the ROS is not an exact science (USDA Forest Service 2003); therefore, as each ROS was developed, each incorporated the best available science and GIS techniques. The original ROS was created for the existing plan and is retained under alternative A. The ROS under alternative A underwent numerous revisions and changes through amendments to the 1987 plan.

Agency protocols established in 2003 were the basis for the methodology used for the inventory of existing conditions (USDA Forest Service 2003). The existing condition ROS mapping process was completed by TEAMS Enterprise and was reviewed, edited, and finalized through an interdisciplinary approach during the Plan Revision Process (Hill 2016). Subsequently, internal comments were received regarding the ROS maps expressing concern about some of the designations assigned. In the past four years, access issues, new motorized trails, flooding and flood control projects as a result of Schultz Fire, utility corridors adjacent to recommended wilderness areas have resulted in small changes in conditions that the Forest has included since 2011. Adjustments in the ROS have been made in the concern level of some roads as a result of Travel Management implementation, and some errors have been corrected in the forest ROS layers based on findings from project level analysis.

The ROS methodology used to map the desired conditions under alternatives B (modified), C and D took a raster-based GIS approach which incorporated and elaborated on the 2003 theories and protocol. Through the use of map algebra naturalness, access, remoteness, facilities and site management were incorporated to identify the spatial arrangement of recreational opportunities and ROS classes throughout the forest (Hill 2016).

The Wilderness Opportunity Spectrum (WOS), an extension of the ROS, was developed to address the specific recreational experiences and management complexities found within wilderness areas. Designated Wilderness has been set aside to provide for the recreational and experiential opportunities of solitude found within primitive and pristine natural ecosystems. “Primitive, as defined within the ROS context, is an extremely broad category and when applied within Wilderness, does not adequately differentiate the characteristics and attributes of the setting” (USDA Forest Service 2003) Through the four unique classifications (Transitions, Semi-Primitive, Primitive and Pristine) found within the WOS, the uniqueness of these areas can be identified and managed accordingly.

Unlike the ROS, an accepted protocol for mapping and identifying WOS classes currently does not exist. Under alternative A, and the 1987 plan, the WOS was created through a small interdisciplinary team and hand drawn on 1:24,000 USGS quarter quadrangle Mylar maps. These maps were scanned, geo-referenced and digitized within GIS and incorporated under alternative A. The WOS developed for alternatives B (modified), C, and D applied modern GIS techniques, best available data, and thus a more consistent methodology through addressing more site and value specific parameters than was used under alternative A. Thus the primitive ROS setting was officially retained, even though some plan language was added referring to use of WOS. Building off the raster concepts and techniques used for the ROS, the WOS under alternative B (modified) took into consideration the natural character, types and levels of recreational use, access, remoteness and existing management directions of Wilderness Areas (See project record for detailed methodologies).

All existing, Designated Wilderness, has been assigned WOS classes as noted above. In contrast, recommended wilderness will retain the ROS class of primitive until Congressional action is taken to designate particular wildernesses. Recommended wilderness will be managed to retain the wilderness characteristics for which it was evaluated.

The areas having a Primitive ROS class include Kendrick Mountain and Mazatzal Wildernesses for which the alternatives B (modified), C and D would defer to the mapping ROS or WOS mapping on the Kaibab or Tonto National Forest respectively. (Designated Wildernesses are assigned a primary forest for management even though some of the wilderness area may be found on one or more forests.) In addition, any areas within designated wilderness are subject to all laws, regulations, and policies related to wilderness, regardless of the ROS classification.

All recommended wildernesses (alternatives B (modified) and C) would retain a primitive ROS class. This is different than a WOS class of wilderness-primitive. For the purposes of this plan, primitive ROS allows for mechanized (bike) use on designated trails and the potential for motorized elk retrieval under the Travel Management Rule (TMR) decision (Forest Service 2011i).

Finally there is a small canyon bottom next to Walnut Canyon National Monument that the Forest Service and National Park Service have agreed to manage as primitive.

The National Visitor Use Monitoring (NVUM) project is a nationwide survey that is conducted on every national forest every 5 years. The surveys are in-person exit interviews and are administered at sites that are selected from a stratified random sample based on level of use (high, medium and low) and type of site (day-use, overnight, general forest and wilderness). The sample is used to estimate forest-level visitation data based on a model that is designed based on nation-wide trends and assumptions. The NVUM is a statistically sound methodology, and is currently the only method the agency has to estimate forest visitation. This ensures that all national forest visitor estimates are comparable. The corresponding limitation is that it cannot be generalized below the forestwide level without supplemental collections. The reliability of the data also is dependent upon the consistent classification of sites and survey design as well as the assumption that the on-the-ground conditions are not very unusual. For example, a year with no snow and lengthy forestwide fire closures would yield very low results because of an abnormal amount of canceled survey days and reduced winter recreation. This report uses data from the 2010 survey and revised 2005 data. NVUM surveys were completed in 2015, but the Coconino NF results of the surveys were not yet published at the time of these updates. National NVUM data (compiled from the results of all national visitor surveys) were available and have been used as a estimated comparison of trends. The original 2005 data had much wider confidence intervals and higher error rates but adjustments to the estimation methodology have improved this issue. The NVUM surveys began in 2000, however the data was a beta-test of the methodology and is not comparable to the 2005 and 2010 data because of a different sampling methodology; it is not used in this report. Visitation in this survey is measured in site visits which are “the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time” and national forest visits which can be composed of multiple site visits. The NVUM does not identify the type of recreation preferred by visitors or track how visitors whose desired activities is not offered are displaced. It only captures the activities of the person surveyed during the particular National forest visit being counted (USDA Forest Service 2016b and USDA Forest Service 2016c).

The National Survey on Recreation and the Environment (NSRE) is a general population telephone survey of people age 16 and older. It focuses on outdoor recreation activities wherever they may occur, not just those in the national forest or grassland. The value of this information lies in the insights it provides into overall population demand for outdoor recreation. Population-wide demands can represent broad interests, which a national forest or grassland might serve. The data shows an outdoor recreation “participation rate,” which is the proportion of people 16 or older living in the local area counties who indicated in the survey that they had participated in an outdoor activity 1 or more times during the past 12 months (USDA Forest Service 2002a).

INFRA is the corporate Forest Service Database that tracks data on infrastructure and permits. This database is continuously updated and so the data pulled from day-to-day may be different. INFRA data used in this report has been saved in the project record so as to freeze the raw data that was used to support analysis and effects statements. There may be data flaws associated with the databases in INFRA depending on how well the data has been maintained and how the data entered was collected.

Assumptions for Recreation

In the analysis for this resource, the following additional assumptions have been made:

- Recreation demand is generated by population changes and economic conditions more strongly than by plan direction (Cordell et al. 1999).
- The budget for constructing and maintaining developed recreation facilities will be flat to decreasing in the future, except in areas that have been converted to fee sites or concessionaire contracts.
- The amount of road construction under each alternative will be dependent on-site-specific needs for future projects.
- Most of the roads within areas designated not suitable for public and administrative access roads will be closed over the life of the plan but there will be some exceptions based on the need for main road access and access to private land.

Special Areas

Wilderness Areas

Methodologies used for potential wilderness areas can be found in the Coconino National Forest Wilderness Need Evaluation and the Potential Wilderness Evaluation Inventory and Capability Results reports. These wilderness-related documents may be found at the following website: https://go.usa.gov/xRPZd.

Wild and Scenic Rivers

Methodologies used for potential wild and scenic rivers can be found in the Coconino National Forest Eligibility and Classification for Wild, Scenic, and Recreational River Designations reports. These wild and scenic river-related documents may be found at the following website: https://go.usa.gov/xRPZd.

Research Natural Areas

Methodologies used for proposed research natural areas can be found in the Coconino National Forest Research Natural Area Evaluation Report. Additional documents related to research natural areas may be found at the following website: https://go.usa.gov/xRPZd.

Geological and Botanical Areas

The analysis focuses on an existing designated geological area (GA)(Red Mountain GA) and four existing designated botanical areas (BA)(Verde Valley, Mogollon Rim, Fossil Springs, and Fern Mountain) on the Coconino NF, as well as a proposed geological and botanical area in Cottonwood Basin.[18] These areas are described using information from available literature and from field visits conducted at the proposed special areas in Cottonwood Basin over the period 2006 to present. The geologic history of these areas is described within this information as well as the scientific and research interest and significance. Management concerns were also identified.

The alternatives are compared on the basis of how they would protect and preserve the geological and botanical features and conserve the scientific values of these areas. The alternatives were also compared for the potential resource impacts that may result from mechanized recreation (e.g., bicycle use) on designated trails in geological and botanical areas. This was a qualitative analysis.

[18] The Cottonwood Basin Geological and Botanical Area is proposed as part of alternative B (modified) and alternative C. Alternative D only proposes the geological area.

Since the land management plan provides a programmatic framework that guides site-specific actions, but does not authorize, fund, or carry out any project activity, there are implications or longer term environmental consequences of managing the forest under this programmatic framework. Thus, the focus of this environmental analysis is on the consequences of the alternatives on the desired conditions for the geological and botanical area resources.

Assumptions for Geological and Botanical Areas

In the analysis for geological areas, additional assumptions have been made:

- Management plans will be developed as directed by the designated line officer with the appropriate NEPA process once new geological or botanical areas are authorized under the revised plan.

Scenic Resources

In 1987, when the Coconino NF plan was adopted, scenic resources were inventoried and analyzed using the visual management system as outlined in Forest Service Handbook 462 (USDA Forest Service 1974). This system, which was released in 1977, established standards of measurement (i.e., visual quality objectives) for assessing proposed and existing impact to scenic quality.

In 1995, after 20 years of experience with the visual management system and after additional research in the public and private sectors, the Forest Service revised the visual management system and replaced it with the scenery management system. This revised system is described in Agricultural Handbook 701, Landscape Aesthetics: A Handbook for Scenery Management (USDA Forest Service 1995a). The scenery management system was used in combination with the visual management system in this analysis because the scenery management system will not fully replace the visual management system on the Coconino NF until the revised Forest Plan is adopted. The references for this section are located in Volume 2 of the FEIS.

Although the visual management system and scenery management system both manage scenic resources, differences between the systems exist. Most concepts are the same in both systems, but often terminology has changed. Both systems establish objectives (visual quality objectives or scenic integrity objectives) to measure the degree of alteration or deviation permissible in a landscape. The definitions for these objectives are similar, but application is slightly different.

The visual management system measures alterations in terms of the degree of acceptable alteration of the characteristic landscape. Any human alterations or changes in the landscape that do not repeat or borrow from features of the characteristic landscape would be considered negative. The visual management system handbook also establishes durations of impact for visual quality objectives: retention should be accomplished during project operation or immediately after project completion; partial retention should be accomplished as soon after project completion as possible or at a minimum within the first year; modification should be accomplished in the first year; and maximum modification within 5 years (USDA Forest Service 1977).

Landscape character description is one of the components the scenery management system uses to determine if assigned scenic integrity objectives are being met. Environmental context for the scenery management system can be provided by measuring deviations from the existing landscape character, and ecosystems. With ecosystems providing the context, no specific duration of scenic impacts are assigned to a scenic integrity objective, but rather the focus is on movement toward the desired condition (USDA Forest Service 1995a, p. 20). It should be noted that although specific timeframes are not assigned in the SMS Handbook, duration of impacts are always considered in site-specific project planning and analysis with the direct intent to provide high quality scenery and achieve the highest scenic integrity possible

(USDA Forest Service 1995a, pp. 5–9). The scenery management system also recognizes positive cultural landscapes or cultural scenic attributes where some human alterations have become accepted over time to become expected images or valued features in the landscape contributing to high-quality scenery. The scenery management system also places emphasis on constituent analysis.

The scenery management system, as outlined in Agricultural Handbook 701, is today's best science to achieve high-quality scenery as an outcome of national forest ecosystem management practices. Scenery management system inventories were completed for the Coconino NF as part of the land and resource management plan revision process.

ArcMap and geographic information system (GIS) data layers were used to analyze current forest plan direction for scenic resources (referred to in the current forest plan as visual resources), inventory scenic resources as outlined in the scenery management system to determine the existing condition of scenic resources, develop scenic integrity objectives for the action alternatives, and analyze the alternatives in regards to desired conditions for scenic resources (visual quality objectives or scenic integrity objectives). Scenery inventories were completed through site visits to various parts of the forest, interdisciplinary meetings with forest personnel, review of photos of the forest, use and interpretation of GIS data to develop data layers for all scenery inventories, and review and analysis of research and similar projects.

The scenic resources analysis provides key findings of the scenery inventory process to describe the existing condition of scenic resources. The scenery inventory process is fully documented in the Scenery Management System Inventory Report for the Coconino National Forest Land and Resource Management Plan Revision (SMS Inventory Report) (USDA Forest Service 2015a), which may be found at the following website: https://go.usa.gov/xRPZd.

The effects analysis considers how each alternative manages scenic resources by considering the goals, objectives, standards, and guidelines in each alternative for the management of scenery and the amount of each visual quality objective established or scenic integrity objective proposed on National Forest System lands in each alternative. To ensure clarity, the following crosswalk between visual quality objectives and scenic integrity objectives is provided (Table C- 20).

Table C- 20. Scenic integrity, visual quality objective, and perception crosswalk (USDA Forest Service 1995a, p. 2-4)

Scenic Integrity (Existing and Objective)	Visual Quality Objective	The Forest's Scenic Integrity as People Perceive It
Very High	Preservation	Unaltered; landscape character is intact
High	Retention	Appears unaltered; deviations to landscape character are not evident
Moderate	Partial Retention	Slightly altered; deviations are subordinate to landscape character being viewed
Low	Modification	Moderately altered; deviations begin to dominate the valued landscape character being viewed
Very Low	Maximum Modification	Appears heavily altered; deviations may strongly dominate the valued landscape character.
Unacceptably Low	Unacceptable Modification	Appears extremely altered; this level is only used to inventory existing scenic integrity. It is never an objective on National Forest System lands

The very high, high, and moderate scenic integrity objectives result in a relatively natural-appearing landscape. It is important for national forests to manage scenery at this level. "Research has shown that

high-quality scenery especially that related to natural-appearing forests enhances people's lives and benefits society" (USDA Forest Service 1995a, p. 17). It should also be noted that according to Floyd Newby's findings, "people expect to see natural or natural-appearing scenery," (quoted in USDA Forest Service 1995a, pp. 2–3). Furthermore, "research shows that there is a high degree of public agreement regarding scenic preferences. This research indicates that people value most highly the more visually attractive and natural-appearing landscapes" (USDA Forest Service 1995a, p. 30).

Gobster (1994) summarizes preferred scenic settings as having four common attributes: large trees; smooth, herbaceous ground cover; an open mid-story canopy with high visual penetration; and vistas with distant views and high topographic relief. Visual access, or how far one can see into a forest, is also a preferred scenic setting (Ryan 2005). In the long term, when these scenic preferences are part of the desired landscape character, scenic resources will have higher scenic quality if visual access is achieved or enhanced.

The 1992 visual quality objectives (VQOs) GIS corporate data layer (VQO GIS data layer) was reviewed as part of this analysis. Two errors were found and corrected in order to accurately compare the VQO GIS data layer with SMS GIS inventories and proposed scenic integrity objectives (Dechter and Minor, personal communication). Even with these corrections, the VQO GIS data layer did not always have a direct correlation to SMS inventories due to differences in handbook direction and how these inventories were completed. For example, the SMS inventories were completed for all forest lands, while VQO GIS data layer did not include full VMS inventory mapping in designated wilderness areas.

Methodology in Mapping Scenery Management System Components

As part of the plan revision process, the Coconino NF inventoried scenic resources using the scenery management system. For more detailed information on the development of the scenery inventories and GIS analysis methods used, the reader is referred to the SMS Inventory Report (USDA Forest Service 2015a).

The scenery management system process involves identifying scenic components as they relate to people, mapping these components, and assigning a value for aesthetics. These maps provided information to the planning team to assist them in making a decision relative to scenery as a part of ecosystems and in determining the tradeoffs related to forest plan management scenarios.

Landscape Visibility and Concern Levels

Landscape visibility is composed of two parts: human values as they relate to the relative importance to the public of various scenes (concern levels) and the relative sensitivity of scenes based on distance from an observer (seen areas and distance zones).

Human values that affect perceptions of landscapes are derived from constituent analysis. Constituent analysis serves as a guide to perceptions of attractiveness, helps identify special places, and helps to define the meaning people give to the landscape. The constituent analysis for the Coconino NF involved the following: reviewing and incorporating key direction from Sedona-Oak Creek Ecosystem (Amendment 12) and the Flagstaff/Lake Mary Ecosystem Analysis (Amendment 17), as these amendments were developed through extensive public involvement; reviewing requests for special area designations made by the public; reviewing SMS inventories in interdisciplinary workshops; reviewing SMS inventories, particularly the proposed SIOs during the March public meetings; having the SMS inventories available for review during the February/March "office hour" sessions; and reviewing public comments received on the DEIS for scenic resources.

Constituent analysis leads to a determination of the relative importance of aesthetics to the public. This importance is expressed as a concern level. Sites, travel ways, special places and other areas are assigned a concern level value of 1, 2, or 3 to reflect the relative high, medium, or low importance.

The Forest Social Science Analyst along with the forest and District Landscape Architects interviewed the district recreation staffs and identified concern levels for the forest's travel routes and use areas. Routes identified as dispersed camping corridors in the Travel Management process were also reviewed as a proxy to determine where people desire to go car camping. The road, trail, and stream systems of the forest were rated as a concern level 1, 2, or 3, primary, secondary, and secondary with low use and moderate to low interest in scenery respectively, as defined in the SMS handbook. All recreation use areas on the Coconino NF were assigned concern level 1 and are shown on the concern level map as use points. This system was also applied to travelways outside of the forest that can see into the forest. A map of concern levels can be found in appendix A of the Scenery Specialist Report (USDA Forest Service 2015b), displaying the concern level travelways and use points identified for the Coconino NF.

Seen areas and distance zones are mapped from concern levels to determine the relative sensitivity of scenes, based on their distance from an observer. These distance zones are identified as:

- Foreground – up to one-half mile from observer
- Middleground – one-half mile to 4 miles from the observer
- Background – 4 miles from the observer to the horizon

The visibility analysis was generated in ArcInfo GIS, using the concern level data layers. Viewpoints were generated at roughly one-eighth-mile intervals for concern level 1 roads, trails, and streams and roughly one-eighth-mile (200 meter) intervals for concern level 2 roads and trails. Viewpoints were generated at roughly 195 feet (60 meters) for concern level 1 and 2 streams due to the meander of the water course and dynamic topography in most stream canyons. A viewpoint layer of concern level use points, which included points not generated from the travel route intervals, was also used to determine seen areas. These use points included overlooks, developed recreations areas, lookouts, and points identified by forest personnel for key views. The visibility analysis was completed for concern levels 1 and 2 only because areas seen by concern levels 1 and 2 would override most areas seen by concern level 3.

The viewpoints were analyzed in combination with the 30-meter digital elevation models (DEM) of the forest. The DEM was processed in GIS to run the visibility commands. Only the topographical/elevation information was used to determine seen areas. Vegetation was not considered in this analysis, because vegetation, being dynamic, may change over time due to natural disturbance or human activity. Vegetative screening is important for short-term detailed planning at the project level. However, vegetative screening is inappropriate to consider in long-term, broad-scale planning, such as forest planning (USDA Forest Service 1995a, p. 4-5). A background viewing distance of 4 to 15 miles was used for this analysis, because little detail is discernible beyond 15 miles. When an area was assigned to more than one distance zone, the distance zone reflecting the highest concern level use point or travelway was assigned, according to the matrix outlined in the SMS handbook (USDA Forest Service 1995a, p. 4-12).

Inevitably, the visibility computer analysis results in some acres that are "unseen." These areas are referred to in the SMS handbook as seldom seen since they may be seen, at a minimum, from aircraft and an occasional viewer wandering through the forest (USDA Forest Service 1995a, p. 4-11). Seldom seen areas are areas not seen from travel routes or identified use points. These areas are assigned a concern level 1, 2, or 3, based on concern for a specific area and may occur in any distance zone or scenic attractiveness class. A concern level use areas layer, including designated wilderness areas, potential

wilderness areas, wild and scenic river corridors, and inventoried roadless areas was used to determine and assign a concern level to these "unseen" areas. Designated wilderness areas and potential wilderness areas, and wild and scenic river corridors were assigned concern level 1. All other unseen areas were assigned concern level 3. A map of landscape visibility can be found in appendix A of this FEIS.

Scenic Attractiveness

Scenic attractiveness is the primary indicator of the intrinsic scenic beauty of a landscape and of the positive responses it evokes in people. Scenic attractiveness classes are developed to determine the relative scenic value of lands within a particular landscape character. It helps determine landscapes valued for scenic beauty, based on commonly held perceptions of the beauty of landform, rock form, vegetation pattern, composition, water characteristics, land use patterns, and cultural features. Scenic attractiveness indicates varying levels of long-term beauty of the landscape character, regardless of existing conditions. The three scenic attractiveness classes are: Class A-distinctive; Class B-typical; Class C-indistinctive.

The Forest Landscape Architect updated the scenic attractiveness inventory between the draft and final environmental impacts statement after review of public comments and to reflect field review and experience in implementing the inventory. The SMS Inventory Report (USDA Forest Service 2015a) provides the detailed process used to evaluate, update, and verify the scenic attractiveness classes for the Coconino NF.

Scenic Classes

All national forest landscapes have value as scenery. Using the data gathered and mapped for scenic attractiveness and landscape visibility, a numerical scenic class value is assigned to forest lands. The ratings 1 to7 indicate the scenic value of landscape areas, irrespective of existing scenic integrity.

Scenic classes are determined and mapped by combining the three classes of scenic attractiveness with the distance zone and concern levels of landscape visibility as outlined in the Scenic Class Matrix found in the SMS handbook and shown in Table C- 21.

Table C- 21. Distance zones/seldom seen and concern levels

Scenic Attractiveness	Fg1	Mg1	Bg1	Fg2	Mg2	Bg2	ss1	ss2	Ss3
A	1	1	1	2	2	2	1	2	3
B	1	2	2	2	3	4	2	3	5
C	1	2	3	2	4	5	3	5	7

Note: Only the portions of the Scenic Class Matrix applicable to the Coconino NF SMS inventory process are shown in this table. For the full Scenic Class matrix see the SMS handbook (USDA Forest Service 1995a, p. 4-16).

Existing Scenic Integrity

Existing scenic integrity (ESI) indicates the degree of intactness and wholeness of the landscape character. Conversely, ESI is a measure of the degree of visible disruption of the landscape character. Disruptions in the landscape character most often come from human alterations to the landscape, such as roads or vegetation management. A landscape with very minimal visual disruption is considered to have high ESI, while landscapes with more noticeable disruptions are viewed as having lower ESI. Existing scenic integrity is expressed and mapped in terms of very high, high, moderate, low, very low, and unacceptably low.

ESI levels were determined for the Coconino NF landscapes using GIS data layers. Activities altering the landscape that were used include: utility corridors, travel management, and livestock grazing activities.

Other GIS data used includes: designated wilderness areas, potential wilderness areas, roadless inventory, Recreation Opportunity Spectrum, wildland fire, and insect and disease outbreaks. National Agricultural Imagery Program aerial imagery from 2008 was used as a reference (at a general scale of 1:24,000) to identify changes in the landscape that may not be found in the available GIS data layers and may be noticeable from aerial views. Due to time constraints, which limited field review, most ESI levels were rated from an aerial view, which is consistent with SMS Handbook direction (USDA Forest Service 1995a, p. 2-6). Activities and lands in other ownerships were not reviewed or rated in detail, but were generally rated the same as adjacent forest lands.

The Scenery Specialist Report (USDA Forest Service 2015b) provides a summary of the existing scenic integrity inventory. The SMS Inventory Report (USDA Forest Service 2015a) provides the detailed process used to determine and rate existing scenic integrity for the Coconino NF.

Proposed Scenic Integrity Objective Development Process

Scenic integrity levels are discussed and proposed for all National Forest System land acres during the forest planning process using the information in the scenery inventories as guidance. Once a final plan alternative is adopted, the scenic integrity levels become scenic integrity objectives (SIOs), which are then used to manage the scenery resource (USDA Forest Service 1995a, p. 4-16). SIOs become part of the new plan and, along with the desired landscape character, provide a system to support future improvements to and maintenance of scenic resources.

For clarity and to reduce confusion with existing scenic integrity levels, the planning team opted to use the term proposed SIOs during the forest planning process for all action alternatives. To help determine proposed SIOs, a composite scenery base map was produced by combining scenic classes and existing scenic integrity levels. This map was used as a starting point for determining proposed SIOs during the interdisciplinary forest planning process. The mapping process is fully discussed in the SMS Inventory Report (USDA Forest Service 2015a). The proposed SIOs in the final environmental impact statement differ from those in the draft environmental impact statement due to the updates completed for some scenery management system inventories.

Proposed SIOs were initially determined regardless of the theme or focus of any proposed management areas. The desired condition of scenery for the area was the main consideration. An interdisciplinary team reviewed the proposed SIOs and made refinements based on local knowledge and expertise. The refinements made to determine the proposed SIOs are documented in meeting notes from forest planning meetings. Further refinements to proposed SIOs were made throughout the forest planning process using the proposed management areas and input from the extended forest planning interdisciplinary team. Established or proposed SIOs of adjacent forests were reviewed to ensure as much consistency as possible of SIO allocation across forest boundaries. Maps of the proposed SIOs for each alternative can be found in appendix A of this FEIS.

Scenery Rehabilitation Development Process

To develop a scenery rehabilitation map, the existing condition of scenic integrity (existing scenic integrity inventory) and desired condition of scenic integrity (proposed SIOs) were compared to see where the existing scenic integrity condition is currently lower than the desired condition for scenic integrity. For example, areas with moderate existing scenic integrity, but a high SIO, are shown on the scenery rehabilitation map as rehabilitate by one level. In some cases, a deviation of three levels may occur (i.e., areas with an existing scenic integrity of very low, but a high SIO). Management activities identified to rehabilitate scenery are anticipated to be able to improve scenic integrity by one level on a site-specific basis during the life of the plan. Areas identified to be rehabilitated by more than two levels may not realize the overall desired scenic integrity for several planning cycles.

Assumptions for Scenic Resources

In the analysis for this resource, the following additional assumptions have been made:

- The principles of scenery management and environmental design will be applied in project-level planning in all National Forest System activities.
- Scenery management techniques and principles will be used to mitigate any future site-specific land-altering activity or introduced elements on the land, to achieve and maintain desired scenic integrity objectives and landscape character.
- Scenery management accomplishments and success of mitigation measures in meeting scenic integrity objectives will be measured. Monitoring will be conducted to determine how projects and programs are affecting scenery.
- Changes in scenery and changes in public expectations related to landscape aesthetics and scenery will be monitored and documented (FSM 2382 – Scenery Management). Changes in public expectations related to landscape aesthetics and scenery would most likely be monitored at a regional or national level, but may also be assessed during scoping for site-specific projects and review of current research when completing scenery analyses for site-specific projects. Scenery inventory GIS data layers will be reviewed during future project-level analysis and updated as ground-truth activities occur to keep the data layers accurate and relevant.

Minerals and Energy

Scope of Analysis and Data Sources

The following dataset information sources were reviewed for information on past, potential, and active mineral uses and resources across the Coconino NF. Although data quality is discussed, the overall uncertainty of data and information presented here is very low. All data were derived from agency and professional reports and databases. The references for this section are located in Volume 2 of the FEIS.

Mineral uses and resources that were evaluated include: locatable and leasable minerals (geothermal) and common variety mineral materials. More detailed reviews were carried out for each recommended wilderness area, proposed special areas (including geologic and botanical), and research natural areas. Eligible wild and scenic rivers were not reviewed because once established by statute they would be withdrawn from locatable mineral entry. Past, potential, and active mineral uses were also reviewed within areas of very high scenic integrity.

The LR 2000 (datasets #1, #9) is a national database developed by the Bureau of Land Management and is used by agencies and the public. A user can run reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, rights-of-way, coal and other mineral development, land and mineral title, mining claims, withdrawals, classifications, and more on Federal lands or on Federal mineral estate. The data quality is good.

The Database for Mineral Districts in the State of Arizona (dataset #2) is produced by the Arizona Geological Survey and this GIS coverage and the book reference is widely used by specialists doing mineral reports. The data quality is good and for many mineral districts, there is a reference list that provides further information about the history and production of mineral districts.

The Mineral Resource Appraisal of the Coconino National Forest, Arizona (dataset #3) (Lane 1992) is a study conducted by the U.S. Department of Interior, Bureau of Mines. The Bureau of Mines is charged with the collection, analysis, and dissemination of information about mining, mineral resources and

mineral processing of the United States and the world. The Bureau of Mines has conducted similar studies of mineral resource potential for many of the national forests in the western United States, and these data are commonly used in mineral reports. The data quality is excellent.

The Bureau of Mines established the Minerals Availability System (MAS) in 1975, to ascertain the potential supply of selected mineral commodities. The MAS database describes over 5,000 significant mines, deposits, and minerals processing plants around the world with operation-specific feasibility evaluations. The Mineral Industry Location System (MILS), provides location and identification information on about 22,000 (mostly U.S.) mineral sites. The MAS/MILS GIS database is the result of the inventorying process (datasets #7, #8). The mineral sites have varying degrees of data quality and location accuracy. The information was compiled from state mineral survey publications and other literature sources going back to the 1800s and continuing to the 1970s. The MAS/MILS database and GIS coverage is commonly used by the Forest Service and Bureau of Land Management in their abandoned or inactive mine surveys, and together with the voluminous literature about mines and mining, make this a valuable database to survey the mineral potential of an area. The MAS/MILS database GIS coverages are commonly used in mineral reports. The Mineral Favorability database is derived from the MA/MILS database. Overall, the data quality is excellent.

The IWEB/INFRA Database for Minerals and Geology (dataset #6) is a Forest Service database used to track sales and free use offerings of mineral materials as well as other mining-related administrative actions. The data quality is good for sales of minerals to the public, but the database does not track Forest Service use or county use of mineral materials very well because information of this use is not always entered in.

The Forest Rock Pit Inventory (USDA Forest Service 1995b) and Coconino-Kaibab Rock Pit NEPA geodatabase (USDA Forest Service 2011b) and Pits shapefile (2005) (dataset #5) are all Coconino NF data and inventories. Used together, and with aerial photography, active, inactive, and proposed rocks pits on the forest can be identified. Overall, the data quality is good.

Articles on Geothermal Potential of the San Francisco Volcanic Field **(**Duffield et al. 2000, Morgan et al. 2003, and Morgan et al. 2004) (dataset #4) were used to determine the geothermal potential of the San Francisco Volcanic Field. The data quality of these reports is good.

Mineral withdrawal data used (dataset #9) came from internal Forest Service files letters, and data; discussions with Linda Fox, the Forest Realty Specialist; and Bureau of Land Management LR2000 information. The data were used to determine the status of existing and expired mineral withdrawals on the forest. The data quality is good.

The Arizona Oil and Gas Conservation Commission's Oil and Gas Well viewer (dataset #10) is an excellent way to view past oil and gas wells drilled in an area and the well report folder has a wealth of information on the drilling, geological reports, and final capping of the wells. From this viewer, about 38 wildcat wells[19] have been drilled on the forest during the 1960s through the 1980s. No oil or gas resources were found, although methane gas was noted in some of the wells at depth. The well reports also contain information on whether water was encountered in the well.

Using these datasets, the evaluation of energy and minerals included the following items:

[19] Wells that are drilled in areas of no known oil and gas resource potential.

- How guidance has been updated on appropriate locations for mineral development and associated rehabilitation, as well as energy development and associated infrastructure. This is a qualitative analysis.
- The amount (acres) of land currently withdrawn from locatable mineral entry (same for all alternatives).
- The amount (acres) of land that could be recommended to be withdrawn from locatable mineral entry, by alternative and type, such as wilderness, special areas, etc.
- This analysis also reviewed the proposed wildlife habitat management areas and areas of Very High scenic integrity objectives for mineral resource potential. This was a qualitative analysis.

Assumptions for Minerals and Energy Resources

In the analysis for minerals and energy resources, additional assumptions have been made:

- The forest has the capacity to evaluate process and administer mineral activities.
- The economy will fluctuate and influence mineral exploration.
- Past mineral uses, mining claims, and activities provide a useful indication of current and potential future uses and activities on the forest.
- New technologies will influence mineral exploration and development.
- There are no leases on the forest for the following leasable mineral resources: oil and gas, oil shale, coal, or geothermal. See the affected environment section for discussions of past leases and current interest.
- The Forest Service would respond as a cooperating agency when requested by the BLM, which is the lead agency for subsurface mineral extraction, including geothermal. Because there are no current leases, the consequences to leasable minerals will not be analyzed for this FEIS.
- Possible mineral and energy resource opportunities lost by existing and recommended wilderness, wild and scenic rivers, and special areas that once designated would likely be withdrawn from mineral entry or could have no leasing stipulations.

Forest Products

The alternatives were compared on the basis of how they would provide forest product resources to the public. This was a qualitative analysis. Related sections and associated methodologies, including Vegetation and Fire and Socio-Economic Analysis sections in the FEIS and information disclosed in appendix G, provide other analysis related to forest products.

Heritage Resources and Tribal Relations

Data Limitations

To address the current condition and potential effects of the various plan alternatives on heritage resources, various sources of information and data summaries from the Coconino NF's archaeological site and survey files were used. These data summarized the numbers of known sites, archaeological site densities, and cultural sensitivity of different parts of the forest.

Within the exterior boundary of the Coconino NF, site information has been recorded for approximately 10,000 archaeological sites. This includes approximately 787 "Legacy Sites"—early sites reported before 1960 by the Museum of Northern Arizona that have not yet been relocated and re-recorded to current

standards; 291 sites on National Park Service land, mostly Walnut Canyon National Monument; 130 sites on private land, 51 sites on county or municipal lands, and approximately 8,741 sites recorded since 1975, when the forest's heritage program was established.

All sites with confirmed locations are plotted on the forest's GIS map layers with supporting information in a geodatabase. An Archaeological Site Log spreadsheet has records for approximately 6,500 sites and 9,240 sites are presently entered into INFRA (as of December 7, 2010). There are a number of information systems that today comprise the Archaeological Site Survey of the Coconino NF. Various types of computerized information for roughly 6,000 to 9,000 sites is available and sufficient to characterize and make reliable conclusions about the nature and condition of archaeological sites on the Coconino NF.

Archaeological Site Density

To evaluate the archaeological sensitivity of different parts of the forest, a simple model was developed that predicts the potential number of sites per square mile within different environmental situations as reflected by the 134 soil/moisture/vegetation units defined by the Terrestrial Ecosystem Survey (TES) for the forest. The Forest Service developed the Terrestrial Ecosystem concept to characterize the various environmental areas of the forest by considering a number of environmental variables such as geological substrate, slope, aspect, existing vegetation, historical vegetation, moisture, and soil type. All of these variables are important when considering the relationships between the environment and prehistoric land use patterns.

For purposes of evaluating the potential effects of projects and activities, site sensitivity is defined as the potential site density of the area that could theoretically be impacted by various actions. The potential site density for each of the 134 TES units is determined by dividing the number of sites recorded within each TES unit by the total acres that archaeologists have physically examined within each TES unit. This provides an estimate of the number of sites per acre which, when multiplied by 640 (the number of acres within a square mile), provides the estimated number of sites per square mile within each of the TES units. The estimated site density for each TES unit was plotted as a histogram, ranging from low to high, and by identifying natural breaks in the histogram, five site density classes were defined (Table C- 22).

Ratings of simple site density were modified into areas of cultural sensitivity for areas that are known to be of traditional cultural importance to modern southwestern American Indian tribes. The degree to which the site sensitivity was upgraded for cultural sensitivity is based upon the relative traditional importance of an area, as understood by the Forest Heritage Resources staff. Hence, the San Francisco Peaks, with their major religious and cultural significance to many tribes, are ranked as extremely high in cultural sensitivity, while the pinyon juniper country east of Winona, an important fuelwood and pinyon nut gathering area for nearby Navajo chapters, is rated as much lower in cultural sensitivity.

Table C- 22. Archaeological site density classes defined for the Coconino NF

Cultural Sensitivity	Estimated Site Density
Very Low	0 sites/square mile
Low	1 to 10 sites/square mile
Moderate	11 to 20 sites/square mile
High	21 to 30 sites/square mile
Very high	30+ sites/square mile

In general, very low to low density areas correspond with the high ponderosa pine forest above the Mogollon Rim. The ponderosa zone on the east side of the San Francisco Peaks, northeast of Flagstaff, however, is a high site density area. High to very high density areas occur in the pinyon juniper zone, particularly in the Verde Valley, along the base of Anderson Mesa, east of Flagstaff, and north of the cinder belt.

Assumptions for Heritage Resources

In the analysis for heritage resources, additional assumptions have been made:

- Analysis and impacts to cultural resources from site-specific actions will be addressed at the time site-specific decisions are made.
- Populations in Arizona will continue to increase, putting further demands on forest resources.

Infrastructure and Facilities

Forest Road System

Information related to the National Forest System (NFS) road system was obtained from the INFRA Database (I-web), and the Coconino NF Geographic Information System (GIS). The INFRA Database is the primary Forest Service database that stores many different types of tabular data. GIS and INFRA are linked to ensure consistency of both and are updated continually to reflect actual conditions in the field.

GIS layers containing polygonal shape files delineating new proposed wilderness areas, special interest management areas, and management areas were used to clip the roads data associated with the 2014 Travel Management Rule (TMR) Motor Vehicle Use Map (MVUM). This provided mileage data for public roads and roads designated “for administrative use only” as per the 2011 Travel Management decision.

In addition, analysis was performed to determine road mileages by Recreation Opportunity Spectrum (ROS). For the analysis, the roads were intersected with the ROS. This analysis allowed for all roads to be associated with their respective ROS class. The mileage was updated to reflect the length segments and the data were imported to an Excel spreadsheet for further analysis. From here, the data were differentiated by ROS Code and status per the recent Travel Management decision and the mileages in each category were summed.

The road mileage by operational maintenance level was obtained from INFRA. This database enables queries to be performed, depending on what type of data you need for analysis. For the FPR analysis, the most recent Road Core information available was downloaded with an effective date of June 8, 2015. The data were filtered and all of the roads that had the following criteria: Jurisdiction as Forest Service, System, as National Forest Service System Road, and Route Status as existing were selected for analysis. Then, Microsoft Access was used to sort the data based on operational maintenance levels 1 through 5 and the mileage was summed for each operational maintenance level. The TMR geospatial layer for the 2011 TMR decision was not used because it included several hundred miles of additional roads such as user created roads or roads crossing non forest service land incorporated into the existing layer. The NFS road system is historically defined as roads that exist in INFRA that have the main three criteria listed above, therefore, the INFRA database was used exclusively for the breakdown of the NFS road system.

The methodologies and analysis described above contain two separate data sources that were analyzed. The data for the 2014 Motor Vehicle Use Map (MVUM) was used to analyze the existing conditions, alternative A (no action), as well as the other alternatives (alternatives B through D) on the NFS road system.

Administrative Facilities

The analysis of administrative facilities was performed using GIS, facility location data (INFRA), and Forest Service visitor maps. Proposed special areas and management area guidelines were analyzed for all alternatives. The location of the expansion areas were determined using GIS and then compared with known administrative facility locations to determine if the proposed alternatives would affect any facilities.

Lands and Special Uses

Various methodologies were used to develop this analysis. Data were obtained through the following resources and databases:

Methodology and analysis process for this report included query of the Infra special uses database (SUDS), use of GIS for inventory and identification of landownership patterns, Forest Service records and case files, and census data to review population trends. SUDS reports of special uses by Township and Range were also used to evaluate possible impacts to existing uses with proposed wilderness and other special areas. In addition, the final rents report was used to determine fee receipts from land and recreation uses.

The INFRA – Special Uses Database (SUDS) was used to determine the type, number, and status of lands special use authorizations. Some use codes were combined into general categories as listed in the Forest Service Handbook 27091.11, Chapter 50 – Terms and conditions use chart. Special use permit numbers were calculated using the status of application approved, pending signature and issued status as of October 2015 end of year Corporate Data Warehouse Infra database. There may be some inaccuracies in the database, including expired permits that are shown as issued and may not be reissued, or closed or expired permits that may still have active uses but are currently not authorized or counted. Short-term permits are not separated from longer-term permits in this query.

Automated Lands Program (ALP)/Land Status Records System (LSRS) Production geodatabase was used to determine land acreages and changes in landownership from 1987 through 2010, including method used. Total Coconino NF acreages were obtained from the land areas of the national forest report.[20]

Review of existing private property locations and their locations in relation to proposed wilderness and other special areas was done using Coconino County's GIS mapping program (https://gismaps.coconino.az.gov/ParcelViewer/), Yavapai County's GIS mapping program, and forest GIS land ownership layers.

Assumptions for Lands and Special Uses

In the analysis for this resource, the following additional assumptions have been made:

- The agency has the capacity to screen, process, and manage special uses, including energy corridors.
- The population of Arizona will continue to grow and be dependent on electricity, communications facilities and other utilities and infrastructure.
- The economy will fluctuate over time and influence energy corridors and adjacent private land and infrastructure development.
- Community and public needs and requests for use of federal land for services and infrastructure, including roads and energy corridors, will continue.

[20] https://www.fs.fed.us/land/staff/lar-index.shtml

- Consumers will continue to demand improved telecommunications services, reliable electricity and other utilities.
- It is anticipated that over the life span of the proposed forest plan that there will be a net increase in forest land acreage although at a much smaller scale than in the previous plan's time period.

Livestock Grazing

The alternatives were compared on the basis of how they would affect management of livestock grazing on the Coconino NF. This was largely a qualitative analysis for most effects under all alternatives.

Assumptions for Livestock Grazing (Common to All Alternatives)

In the analysis for this resource, the following additional assumptions have been made:

- Market demands for livestock products are highly variable. It is assumed that current market demands for livestock products would continue through the next several decades with a continuing demand for grazing of the NFS lands.
- Livestock grazing use would be authorized, dependent on forage availability.
- The Arizona Game and Fish Department manage populations of big game (i.e., mule deer, elk, pronghorn, and bighorn sheep).
- Administrative permittee access will remain consistent with the Travel Management Rule decision (USDA Forest Service 2011i).
- Livestock grazing is not authorized in areas already closed to grazing. In addition, plan components would not close pastures or allotments. If a closure is needed to meet plan components, the closure will be identified during site-specific NEPA.

Determination of Lands Capable for Livestock Grazing

Capability is the potential of an area of land to produce resources and supply goods and services, and allow resource uses under an assumed set of management practices at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology. These have not changed significantly since the evaluation was done for the 1987 plan.

For the 2015 capability analysis, more recent terrestrial ecosystem survey (TES) information was used. Three measures were used to determine capability: (1) forage productivity (less than 100 pounds per acre per year), (2) satisfactory, but inherently unstable soils (based on TES data), and (3) steep slopes (greater than 40 percent slope). Forage productivity and inherently unstable soils were identified using TES information (USDA Forest Service 1995). The TES delineates ecosystems, by map unit, according to their climate, geology, soils, and potential natural vegetation. TES provides wall to wall forestwide information suitable for landscape scale analysis. The data used for the TES was collected between 1987 and 1991. Steep slopes were identified using United States Geologic Survey (USGS) digital elevation models. Both of these data sources are the best available information at the landscape scale.

Forage productivity was determined using the TES values for potential forage production. Areas that have a potential forage production value of less than 100 pounds per acre were considered not capable.

Inherently unstable soils were determined using the TES values for satisfactory, but inherently unstable soils. TES identifies map units with satisfactory, satisfactory, but inherently unstable, unsatisfactory, and impaired soils. Inherently unstable soils are those that naturally cannot support sufficient retention of vegetation cover to slow erosion processes and where annual soil renewability is less than soil loss under

natural conditions. Areas identified with satisfactory, but inherently unstable soil on the TES map were considered not capable at the forest plan level.

To identify steep slopes, USGS digital elevation models were analyzed and used to approximate slopes. Areas with slopes identified to be greater than 40 percent were considered not capable.

Using the information above, there are 1,390,598 acres of potentially capable lands on the Coconino NF (Table C- 23). Because some of these characteristics overlap each other, the acreages are reported in two columns. The Total Acres column reports the total number of acres that were considered to be not capable by each capability characteristic. The Acres for Capability Calculation column reports the number of acres that were considered to be not capable for each capability characteristic, less any acres that were previously determined to be not capable by another capability characteristic. For example, consider the value reported in the Acres for Capability Calculation for acres that have a current potential forage value of less than 100 pounds per acre. This value does not include the acres that have a current potential forage value of less than 100 pounds per acre that were previously identified as not capable due to steep slopes or inherently unstable soils. Using this approach prevents double or triple counting any particular acre.

Table C- 23. Results of the 2011 grazing capability analysis

Characteristic	Total Acres	Acres for Capability Calculation	Source
Coconino NF (total area)		1,842,965	Current acreage from corporate GIS (date)
Slopes >40%	-184,110	-184, 110	USGS national elevation dataset at 10 meter resolution (USGS 2006)
Soils that are Inherently Unstable	-200,328	-100,317[1]	Terrestrial Ecosystem Survey data
Potential forage productivity <100 lbs./ac-yr.	-211,785	-167,940[2]	Terrestrial Ecosystem Survey data
Potentially capable lands		1,390,598	

[1] Does not include acres of soils that are inherently unstable that were already identified as have slopes greater than 40 percent,

[2] Does not include acres of soils that have a current potential forage value of less than 100 pounds per acre that were already identified as have slopes greater than 40 percent and/or inherently unstable soil,

There is an approximate 2 percent difference between capability determined in 1987 and a re-evaluation of capability conducted as part of this plan revision process. The difference between the current and 1987 capability determinations is likely a result of differences in the accuracy of the landscape scale data used for each of the evaluations. Differences may also be due to changes in forest acreages, which vary over time due to factors such as resurvey, improved mapping technology, and updates to corporate GIS layers. More precise information would be reviewed when site-specific environmental analysis is conducted, which could produce different results at the project level.

Determination of Lands Suitable for Livestock Grazing

Procedures in the 1982 planning rule require that grazing suitability be determined in forest planning. In the context of the forest plan, suitability refers to the appropriateness of applying certain resource management practices to a particular area of land. Suitability is determined based on compatibility with desired conditions and objectives in the plan area. Lands within the plan area are not identified as suitable for a certain use if that use is prohibited by law, regulation, or policy; would result in substantial and

permanent impairment of the productivity of the land or renewable resources; or if the use is incompatible with the desired conditions for the relevant portion of the plan area.

An identification of an area as suitable for a particular use does not mean that the use will occur over the entire area. Likewise, identifying that a particular use is not suitable does not mean that the use will not occur in specific areas. The identification of an area as suitable for various uses in the forest plan is *guidance* for project and activity decision-making and is *not a resource commitment or final decision* for projects and activities. Identification of grazing suitability as used in this context is a plan level activity – grazing suitability is not revisited at the project (allotment) level. Final decisions on resource commitments are made at the project level. The final decision to authorize livestock grazing would be made at a project (allotment) level.

Grazing Suitability Determinations Prior to the 1987 Plan

The grazing suitability review identified allotments and portions of allotments that were closed prior to 1987 (prior to the implementation of the 1987 plan). These areas have remained closed over the life of the 1987 plan. These areas were closed for a variety of reasons and the suitability review did not identify any reasons to revisit the closures at this time. The allotments closed prior to the 1987 plan include the Camp Verde, Middle Verde, Montezuma, Rimrock, Cave Hill, and Dry Creek allotments. Portions of the Cottonwood, Cinder, Turkey Tanks, Deadman, Dove Tanks, Frisco Mountain, Hart Prairie, Tom's Creek, Indian Gardens, and Oak Creek allotments. Taken together, these closures resulted in a determination that approximately 118,756 acres of the forest were not suitable for livestock grazing prior to approval of the 1987 plan. The shaded areas in **Error! Reference source not found.** identify the location of the areas determined to be not suitable for livestock grazing prior to the 1987 plan.

Figure C- 9: Grazing suitability determinations prior to the 1987 plan

Grazing Suitability Determinations in the 1987 Plan

Because the 1987 plan does not specifically mention grazing suitability, the grazing suitability analysis begun in 2010 initially equated the plan language of "grazing capacity" with grazing suitability. After closer scrutiny in 2013, that approach was replaced with a thorough review of the language in the 1987 plan associated with livestock grazing. Where the language in the 1987 plan indicated that livestock grazing was not compatible with the desired conditions for a particular area, that area was identified as not suitable for livestock grazing. Examples of language from the plan that indicate an area is not suitable for grazing include "closed to grazing," "exclude grazing," and "prohibit livestock grazing." The lands that are not suitable for livestock grazing according to the 1987 plan are identified in Table C- 24. The shaded areas in Figure C- 10 identify the location of the areas listed in Table C- 24.

Figure C- 10: Grazing suitability determinations in the 1987 plan

Table C- 24. Areas determined not suitable for livestock grazing in the 1987 Coconino National Forest Plan

Description	Rationale	Acres Not Suitable for Grazing	Reference Pages
Strawberry Crater Wilderness	No grazing capacity assigned and is managed at Level A	10,404	Original p. 110
Tundra and upper mixed conifer/spruce-fir slopes within the Kachina Peaks Wilderness (areas above 9,500 feet elevation)	Closed to grazing	12,493	Original p. 110
Stoneman Lake Basin	Area is fenced to exclude livestock grazing below the rim of the basin	364	Original p. 175
Oak Creek Canyon	Closed to grazing; not changed by Amendment 12	5,382	Original p. 186
Developed recreation sites and Arizona Snow Bowl special use authorization area	No grazing capacity assigned	N/A	Original p. 190
Inner Basin (formerly MA 16)	Closed to grazing	1,057	Replacement p. 192
Elden Environmental Study Area	Area not currently open to grazing	495	Replacement p. 199
Old Cave Crater Environmental Study Area	Area not currently open to grazing	761	Replacement p. 199
Griffith's Spring Environmental Study Area	Area not currently open to grazing	321	Replacement p. 199

For each area that was determined to be not suitable for grazing, Table C- 24 provides a summary of the language from the 1987 plan, the number of acres that would not be suitable, and the page number for the

location of the plan language in the 1987 plan. Some of the areas listed in Table C- 24 overlap one another and/or areas that were identified not suitable for livestock grazing prior to the 1987 plan. Accordingly, simply adding the acres listed in table 2 to the total number for acres determined to be not suitable for grazing prior to approval of the 1987 plan would result in some acres being counted more than once. Taking the overlapping suitability determinations into account, upon approval of the 1987 plan, 133,846 acres of the forest were not suitable for livestock grazing.

Grazing Suitability Determinations Since the Approval of the 1987 Plan

The final step of the comprehensive review of suitability for livestock grazing was reviewing decisions that have affected livestock grazing on the forest since the approval of the 1987 plan. This review identified several decisions regarding grazing suitability since the approval of the 1987 plan. Two forest plan amendments were identified that included plan language indicated livestock grazing was not compatible with the desired conditions for particular areas. This review also identified the decision for the Verde River Comprehensive River Management Plan, which excludes livestock grazing from portions of the Verde Wild and Scenic River corridor. Finally, this review identified three grazing decisions that removed grazing from three allotments and three grazing decisions that closed portions of three allotments to grazing.

Information on the location, acreage affected, and the date of these decisions is included in Table C- 25. The shaded areas in Figure C- 11 identify the location of the areas listed in Table C- 25. Considering these decision on grazing along with the suitability determination that was made upon approval of the 1987 plan, 235,256 acres of the forest are not currently suitable for livestock grazing.

Figure C- 11: Grazing suitability determinations since the approval of the 1987 plan

Table C- 25. Suitability determinations made since the approval of the 1987 Plan

Allotment/National Monument	Area (acres)	Date of Decision	Note
Highway 180 right-of-way	420	3/1994	Part of Amendment 10 to the Plan. Right-of-way is not part of any grazing allotment. See New Page 206-4 of the 1987 Plan, as amended
Oak Creek Canyon Research Natural Area and Casner Research Natural Area	2,462	06/24/1998	Forest Plan Amendment 12 includes a standard prohibiting livestock grazing in these research natural areas. See page 196-1 of the 1987 plan, as amended.

Allotment/National Monument	Area (acres)	Date of Decision	Note
Portions of the Buck Springs Allotment	22,115	8/18/2003	The Record of Decision closed the southern pastures that include headwater meadows and shallow drainages removed from grazing. This is included in acreage figure above for areas not within allotments. The reason for removing the pastures is to protect sensitive meadows and habitat for the Little Colorado spinedace (listed as endangered under the Endangered Species Act). These areas are no longer part of the allotment.
Riparian Habitat within the Verde Wild and Scenic River	602	2004	Comprehensive River Management Plan (p. 20) requires livestock grazing to be "excluded from Verde River riparian habitat, unless a site-specific NEPA analysis approved by the forest supervisor authorizes future grazing use. The river corridor should be inspected regularly when livestock are in adjacent pastures to ensure livestock are not in riparian areas." Of the Verde Wild and Scenic River designated 3,057 acres only 602 acres have been identified as riparian
Portions of the Walnut Canyon Allotment	12,672	7/28/2006	The South Newman, Walnut, and West Walnut Pastures were closed to grazing. This was due to lack water for livestock in two of the pastures and a need for protection of Newman Canyon.
Cinder Hills Off-Highway Vehicle MA	13,702	12/20/2002	Part of Amendment 17 (Flagstaff/Lake Mary Ecosystem Analysis) to the Plan. Closed to grazing. Not incorporated into the Forest Plan as Replacement Page 182 in a timely manner. Oversight was corrected on January 16, 2008, when Replacement Page 182 was added by Errata #1 to the 1987 Plan, as amended.
Sedona Allotment	18,136	7/1/1998	Allotment was closed to grazing due to urban interface cattle problems, low forage availability, and need to improve range and watershed conditions.
Boynton Canyon Allotment	5,006	3/1/2000	Allotment was closed due to poor range and watershed conditions, inadequate area to support livestock grazing, very high recreation use that adversely competed with livestock grazing, and inability to graze livestock in a manner that would be within the standards and guidelines of the Forest Plan.
Horse Mesa Allotment	20,885	9/26/1997	Allotment was closed due to poor range and watershed conditions, area is an important wildlife area, inability to graze livestock in a manner that would be within the standards and guidelines of the Forest Plan, and livestock capacity concerns.
South Gyberg, North Sycamore, South Sycamore, Loy Canyon, Secret Mountain, Winter Cabin, 060, and 051 Pastures of the Windmill West Allotment	32,870	9/24/2014	Pastures were closed due to difficulty in managing livestock grazing due to terrain, difficulty in maintaining water sources, and protection of Arizona cliffrose, an endangered plant species.
Total	105,369		

Grazing Suitability Summary

As the discussion on lands identified as not suitable for livestock grazing above reflects, livestock grazing suitability evaluations and decisions have been an ongoing process for decades. Adjustments have been

made as needed over that time period resulting in the current list of lands that have been identified as not suitable for livestock grazing. Table 23 displays a summary of the suitability analysis. The table includes the total number of acres that were determined to be not suitable for the time period prior to approval of the 1987 plan. It also includes the total number of acres that were determined to be not suitable upon approval of the 1987 plan. Finally, the table shows the total number of acres that have been determined to be not suitable at this time. Table C- 26 also displays the percentage of the forest that is or was not suitable based on the forest's current acreage (1,842,870 acres).

Table C- 26. Summary of suitability analysis for livestock grazing, Coconino National Forest

Timeframe for Livestock Grazing Suitability Determination	Acres Determined Not Suitable for Livestock Grazing	Percentage of Forest Not Suitable for Livestock Grazing
Prior to Approval of the 1987 Plan	118,756	6.4
At the Time of Approval of the 1987 Plan	133,846	7.2
Present Day, Including Suitability Determinations Made Since the Approval of the 1987 Plan	235,256	12.8

Considered together, the lands that were identified as not suitable for livestock grazing by the 1987 plan and the time periods before and after its implementation provide an accurate identification of lands not suitable for livestock grazing at this time. The grazing suitability review did not indicate any need to change the current identification of areas not suitable for livestock grazing. The remaining areas on the forest (those not listed above as not suitable for livestock grazing) are being identified as suitable for livestock grazing. As discussed above, a determination that an area is suitable for livestock grazing does not mean that grazing will occur over the entire area. Likewise, identifying that an area is not suitable for livestock grazing does not mean that grazing will not occur in specific areas.

Accordingly, at this time, 235,256 acres (12.8 percent) of the lands administered by the Coconino NF have been determined to be not suitable for livestock grazing. Conversely, there are 1,607,709 acres (87.2 percent) of land on the forest that have been determined to be suitable for livestock grazing. See Map 17 that accompanies the LRMP for the specific areas. The areas identified as suitable for livestock grazing occur within active and vacant grazing allotments. While the identified areas are considered suitable for livestock grazing, not all of the suitable lands are grazed.

Socioeconomic Analysis

Data Sources

Economic impacts were modeled using IMpact Analysis for PLANning Professional Version 3.0 (IMPLAN) and the Forest Economic Analysis Spreadsheet Tool (FEAST), with 2009 data. Data on use levels under each alternative were collected from the Coconino NF's resource specialists. In most instances, the precise change is unknown. Therefore, the changes are based on the professional expertise of the resource specialists (1982 rule, 219.12(g)).

The IMPLAN input-output modeling system and 2007 IMPLAN data (the most recent data available) were used to develop the input-output model for this analysis (IMPLAN Professional 2004). IMPLAN translates changes in final demand for goods and services into resulting changes in economic effects, such as labor income and employment of the affected area's economy. For the economic impact area, employment and labor income estimates that were attributable to use of forest resources for the Coconino NF were generated.

The IMPLAN model is valuable because it captures the direct, indirect, and induced effects resulting from a change in demand. IMPLAN is an input-output model, which depends on the inputs of spending profiles and industry sector data. It then outputs a "response coefficient," which captures the employment response from the effect of a specified demand for goods or services.

The response coefficients, as well as baseline economic data, were exported from IMPLAN models and read into FEAST, a spreadsheet designed to pair IMPLAN response coefficients with resource data to generate an economic contribution report.

Financial efficiency analysis was conducted with QuickSilver Version 6. Data on program expenditures and revenues were provided by the Coconino NF resource specialists and budget staff (1982 rule, 219.12(e)).

Social impacts used baseline social conditions, NVUM visitor profiles (USDA Forest Service 2016c, and information from the Economic and Social Sustainability Assessment (USDA Forest Service 2008b) to discern the primary values that the Coconino NF provides to area residents and visitors. Social effects are based on the interaction of the identified values with estimated changes to resource availability and uses.

Assumptions for Socioeconomic Resources

In the analysis for these resources, the following additional assumptions have been made:

- Information on the timing of costs and benefits was not available for the economic efficiency analysis. Furthermore, the analysis does not provide a full accounting of all costs and benefits. The only benefits considered are program revenues (forest receipts). The only costs considered are direct Coconino NF expenditures.
- The economic impact of grazing was estimated using authorized levels. However, actual use is permitted annually based on a number of factors, such as current forage and market conditions. For consistency, the analysis assumes that current market demand for livestock products would continue throughout the next several decades with a continuing demand for grazing of the forest lands.
- Changes in use levels were estimated using professional judgment. However, actual changes in use are difficult to predict. Only minor changes in expected resource use levels and activities were predicated between alternatives.
- Some of the value of forest management is not captured in market transactions. Non-market goods and services, such as clean air and scenic vistas, have economic values. However, the monetary values of such goods and services are generally unknown. As a result, it is difficult to analyze potential tradeoffs between market and non-market values. In general, management actions that promote forest health will increase non-market values. For the purpose of this analysis, lands with wilderness-related values will be used as a proxy for non-market values.
- The framework for the social analysis employs generalities. Area residents and Coconino NF visitors have diverse preferences and values that may not be fully captured in the description of social consequences. Nevertheless, the general categories are useful for assessing social impacts based on particular forest-related interests.

Wildlife, Fish, and Plants

Information regarding analysis of the Wildlife, Fish, and Plant resources occurs in several locations. The Final Environmental Impact Statement and the project record contain information about federally listed species, species on the Southwestern Region's sensitive species list, other planning species, bald and golden eagles, management indicator (MIS), ecological indicators, and migratory birds. A Biological Assessment (USDA Forest Service 2017a) analyzes the effects of plan components in alternative B (modified) for all federally listed species and their habitat. The Biological Evaluation compares plan direction in each of the alternatives relative to plant and terrestrial wildlife species on the Southwestern Region's sensitive species list and discloses viability findings for each species for each alternative. The draft Aquatic Species Specialist Report (USDA Forest Service 2016d) compares plan direction in each of the alternatives relative to aquatic species and discloses viability findings for each species under each alternative. The draft Species Viability Report (USDA Forest Service 2017b) compares plan direction in each of the alternatives relative to federally listed plant species, and other forest planning species, and discloses viability findings for each species under each alternative. The primary purpose of the specialist report and species viability report was to provide detailed information to assist in the preparation of the FEIS. As part of a rigorous review process as the FEIS is prepared, edits may have been made to the information included in these reports. The decisions on whether to incorporate edited information into the FEIS was made in close collaboration with the relevant specialists on the Forest. Because the specialist report was prepared as a starting point to assist in the preparation of the FEIS, no efforts will be made to ensure that adjustments that were made while preparing the FEIS were incorporated back into the specialist report. If inconsistencies exist between the specialist reports and the FEIS, the FEIS should be regarded as the most current, accurate source of analysis.

Management Indicator Species

Forest Service Manual (FSM) direction in provides additional guidance for MIS (FSM 2620). MIS are defined as:

- Any species, group of species, or species habitat element selected to focus management attention for the purpose of resource protection, population recovery, maintenance of population viability, or ecosystem diversity (FSM 2605).
- Plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent (FSM 2620.5).

Using the direction in the 1982 Planning Rule and the Forest Service Manual, the Washington Office and the Southwestern Regional Office developed two guidance documents to help forests in selection of MIS. The Forest used the Region 3 paper (Hayward et al. 2010) as the overall guidance for the process. For selection, Hayward and others (2010) identified five key principles to follow:

1. Choose MIS to reflect major management issues and challenges.
2. Choose MIS to facilitate evaluation of the consequences of land management activities.
3. Consider MIS for which population data is readily available, or those chosen on neighboring planning units.
4. Consider whether MIS is the best approach to the management problem. Alternatives include vegetation structure and composition, Management Indicators, or Ecological Indicators.

5. Choose an adequate but limited number of species representing the collection of indicators necessary to effectively monitor the forest plan.

Guidance provided in the Washington Office paper *Best Practices for Selecting and Using Management Indicator Species* (Owen 2010), gave examples of good and bad MIS candidates.

- Examples given of good candidates are:
    1. Species that are relatively common but have high fidelity to specific vegetation types.
    2. Species that demonstrate a strong and/or predictable response to management activities.
    3. Species involved in existing monitoring programs.
    4. Species that are monitored by other entities.
- Examples of bad candidates are:
    1. Species for which monitoring protocols do not exist.
    2. Species that exhibit variable responses to management activities.
    3. Species that are difficult to detect.
    4. Species with life histories that result in high inter-annual abundance.
    5. Species that are very rare.
    6. Species whose populations are constrained or influenced by factors for which we cannot account.

In addition, direction in FSM 2621 calls for involving state wildlife and fish agencies, other Federal agencies, and appropriate experts from universities and private organizations; selecting Federally-listed, Forest Service sensitive species, and species that are in demand for recreational, commercial, or subsistence use. Indicators representing special habitats, habitat components, or communities should be considered.

Internal and external input was received to develop a list of potential MIS species, including Coconino NF wildlife and fish biologists, botanists, and watershed specialists, as well as biologists from the Arizona Game and Fish Department (AZGFD) and the U.S. Fish and Wildlife Service (USFWS). Research biologists from the University of Montana, AZGFD, and the Rocky Mountain Research Station were asked for input. In addition, draft MIS/EI lists were reviewed from the Apache-Sitgreaves, Coronado, Kaibab, and Prescott National Forests to see where opportunities to have species in common might occur.

As a result, a list of potential MIS and EI species was developed (Table C- 27 and Table C- 28) and presented to the Forest Supervisor for selection of indicators to carry forward in the Forest Plan revision process.

Table C- 27. Management indicator species considered for selection

Species	ERU/	Key Habitat	Monitoring	Notes
Pronghorn	Great Basin Grassland, Montane/Subalpine Grassland, Semi-desert Grassland	Diverse composition of grass and forbs; fawn hiding cover.	Ongoing Arizona Game and Fish Department (AZGFD) population monitoring	Good indicator for grassland habitat. Selected by the Kaibab and Prescott NFs but the Kaibab later dropped this as a focal species. Good candidate to evaluate habitat connectivity.
Canyon Towhee	Semi-desert Grassland	Grassland with scattered, dense shrubs.	Ongoing Rocky Mountain Bird Observatory monitoring; have robust density and occupancy information.	Strongly associated with Semi-desert Grassland on the Forest; ERU is highly departed from vegetation and soil reference conditions.
Mexican Spotted Owl	Mixed Conifer with Infrequent Fire, Mixed Conifer with Frequent Fire, Ponderosa Pine (Gambel Oak subtype)	Mature/old-growth mixed conifer and pine-oak habitat.	Ongoing inventory and monitoring in place. Revised Recovery Plan (2012) requires occupancy monitoring	Very strongly tied to these habitats. Restoration focus in Ponderosa Pine (PIPO) and Mixed Conifer with Frequent Fire. The Forest contains the majority of pine oak habitat in the Recovery unit; mixed conifer habitat of greater importance in AZ due to Wallow fire.
Orange-crowned Warbler	Mixed Conifer with Infrequent Fire, Mixed Conifer with Frequent Fire	Mixed conifer habitat with significant deciduous component (aspen, maple, locust, willows, alder).	Ongoing Rocky Mountain Bird Observatory monitoring; have occupancy information. Ongoing long-term research by University of Montana.	Restoration focus in Mixed Conifer with Frequent Fire.
Abert's Squirrel	Ponderosa Pine	Groups of ponderosa pine trees with interlocking canopies.	Ongoing AZGFD monitoring.	Recommended by AZGFD and FWS Restoration focus in PIPO and Mixed Conifer with Frequent Fire.
Pygmy Nuthatch	Ponderosa Pine	Mature ponderosa pine forests and snags.	Ongoing Rocky Mountain Bird Observatory monitoring; have robust density and occupancy estimates.	Restoration focus in PIPO and Mixed Conifer with Frequent Fire.
Species group: Lucy's Warbler, Yellow warbler, Summer Tanager	Cottonwood Willow Riparian Forest Mixed Broadleaf Riparian Forest	Mesquite bosques adjacent to cottonwood willow. Multiple age class distribution in both riparian forests with minimal tamarisk.	Ongoing AZGFD Riparian monitoring. Rocky Mountain Bird Observatory monitoring may contribute.	Lucy's warbler for mesquite bosques adjacent to riparian. Yellow warbler good for cottonwood willow up into mixed broadleaf and avoids tamarisk. Summer tanager needs tall trees within cottonwood willow and up into mixed broadleaf.

For each species, the effects of the direction for program areas, management areas, and specific plan components that could have positive or negative impacts were evaluated. The primary evaluation criterion for effects was the "adequacy of guidance" for species and their habitats. Individual plan components such as standards and guidelines could have negative effects on species and their habitats when looked at singularly; however; the focus of analysis was to determine if overall guidance—proactive, maintenance, or mitigation—was sufficient to protect or enhance species and their habitats as site-specific projects are designed and implemented.

Ecological Indicator Species

Ecological Indicators (EI) are defined as:

- A plant or animal whose population dynamics reflect significant changes in the conditions or productivity of an ecosystem (FSM 2605).
- Plant and animal species, communities, or special habitats with a narrow range of ecological tolerance. Such indicators are selected for emphasis and monitored during forest plan implementation because their presence and relative abundance serve as a barometer of ecological conditions within a management unit (FSM 2620.5).

Table C- 28. Ecological indicators considered for selection

Species	ERU or habitat	Monitoring	Notes
Bebb's Willow and/or Narrowleaf Cottonwood	Montane Willow Riparian Forest	Proper Functioning Condition Assessments Remote sensing data	The woody vegetation component of this riparian forest has declined or been lost and needs restoration. Monitoring will track presence and recruitment.
Bigtooth Maple	Snowmelt drainages within Mixed Conifer with Frequent Fire	Proper Functioning Condition Assessments Remote sensing data	Unique and important component that is declining. Monitoring will track presence and recruitment.
Aspen	Inclusions within mixed conifer, ponderosa pine, and some riparian	Proper Functioning Condition Assessments Remote sensing data Regional Forest Health Aspen Monitoring Flagstaff District volunteer monitoring	Unique and important component that is declining. Monitoring will track presence and recruitment.
Large snags	All Forested and Woodland types	Stand exams FIA data Research findings	Vital component for many wildlife species.
Aquatic macroinvertebrates	Warm or cold water streams	Streams added to or removed from Arizona Department of Environmental Quality impaired or non-attaining lists.	Source of information: ADEQ 305(b) reports. Aquatic macroinvertebrates are indicators of water quality

Species Viability Analysis

The viability evaluation focused on information relevant to the Coconino National Forest. The goal was to use a clear process to identify species for which there are substantive risks to maintenance of viable populations, and to ensure consideration of appropriate habitat management strategies to reduce those risks to acceptable levels where feasible. A viable population has the estimated numbers and distribution of reproductive individuals to ensure the continued existence of the species throughout its existing range (or range required to meet recovery for listed species) within the planning area.

NFMA regulations require providing habitat for species viability within the planning area so the focus of the viability evaluation was on habitat provided on national forest land. Surrounding private lands may contribute to, or hinder, maintenance of species viability on national forest land, but was not relied upon to meet regulation requirements.

The evaluation consisted of a species side, a habitat side, a side where species and habitats were integrated, then a more comprehensive look at how each alternative addressed species and habitats. The species side consisted of developing a species list, associating species with habitat, identifying species-specific threats, and establishing the relative rarity and distribution of the species relative to its habitat on the forest. The habitat side consisted of establishing the abundance, distribution, and quality of habitat on the forest, identifying habitat threats, and determining the likelihood that a specific habitat would be limiting to the associated species. Species rarity and distribution was then integrated with the habitat information to determine the likelihood that a specific habitat would be limiting to each individual species or species group. Plan components in each alternative were evaluated as to how well they contributed to the viability of each species and their habitats.

Species List

A comprehensive list of species (forest planning species) with potential viability concerns was collaboratively developed and compiled by the Coconino National Forest (USDA Forest Service 2009b). Initially about 1,845 species were examined as possible species for further evaluation. Species did not remain on the list for the following reasons: their home range did not overlap the Forest; there was insufficient information available to determine occurrence on the Forest; there were taxonomic uncertainties; there were no known occurrences or suitable habitat on the forest; or species were secure in the planning area. Species were not included if they were 'accidental' or 'transient' at the time of plan development and were not established or becoming established in the plan area. This list was additionally refined based on additional information. Species were included if there was sufficient scientific information for analysis; to conclude there is substantial concern about a species capability to persist in the plan area over the long term; and to evaluate whether the species were considered secure in the plan area or affected by management. A species was considered secure if its continued long-term persistence in the plan area was not at risk based on knowledge of its abundance, distribution, lack of threats to persistence, trends in habitat, or responses to management. NatureServe categories of G/T1 or G/T2 were generally included unless NatureServe threats were not currently present or relevant in the plan area. G/T3, S1, and S2 species were included if best available science indicated there was local conservation concern about the capability of the species to persist in the long term due to: significant threats on and off the plan area to populations or the habitat and ecological conditions they depend upon, including climate change; or there were declining trends in population or habitat in the plan area; or there were restricted ranges (with corresponding narrow endemics, disjunct populations, or species at the edge of their range); or there were low population numbers or restricted habitat within the plan area.

Evaluation of bats and migratory birds focused on breeding populations, unless otherwise indicated. This does not mean that foraging, wintering, and migrating populations were not considered, but that viability evaluation makes the most sense when viewed in terms of the relative stability of breeding populations.

The species list includes species listed as endangered or threatened under the Federal Endangered Species Act; species identified as locally rare on the Coconino NF by Forest Service biologists, local species experts, Arizona Department of Game and Fish biologists, and FWS biologists; species of high public interest including species of high socio-economic concern; and species on the Southwestern Region sensitive species list. Invasive species were not included on this list, but are addressed as threats that affect ecosystem and species diversity. The species list was modified over time based on new information such as changes in the NatureServe conservation status ranks, changes in Federal status, changes in the

Arizona Game and Fish Department's State Wildlife Action Plan list; new and hard-to-find invertebrate information (Stevens & Ledbetter 2014); and changes in the Southwestern Region Sensitive Species list. In addition, after the DEIS was released in 2013, Coconino NF biologists provided additional site-specific information regarding species habitat relationships that resulted in changes in primary ERUs for individual species and adding ephemeral and intermittent riparian drainages as an important habitat element for certain amphibians and reptiles.

The final species list is in three tables in volume 2 of the FEIS: Federally listed species, Forest Service sensitive species, and Other forest planning species. Each table provides the F Rank (described below), primary habitat associations, estimated occupied and potentially suitable habitat, and fine filter (species-specific) threats for each species. Changes in the species list since the DEIS are listed in Table C- 29.

Table C- 29. Summary of changes to species list since the DEIS

Common Name	Scientific Name	Change	Rationale
Amphibian			
Arizona toad	*Bufo microscaphus*	Moved from Sensitive Species list to Other Species list	Species was removed from the Region 3 sensitive species list (2013).
Bird			
Abert's Towhee	*Melazone aberti*	Dropped from further consideration	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G3/G4 S3 (March 2015).
Clark's grebe	*Aechmophorus clarkia*	Dropped from further consideration	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G5 S3 (March 2015).
Common black hawk	*Buteogallus anthracinus*	Moved from Sensitive Species list to Other Species list	Species was removed from the Region 3 sensitive species list (2013). NatureServe conservation rank is G4/G5 S3 (March 2015). Documented threats on forest.
Ferruginous hawk	*Buteo regalis*	Moved from Sensitive Species list to Other Species list	Species was removed from the Region 3 sensitive species list (2013).
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	From Sensitive Species list (candidate for listing) to Federally listed species	Species in AZ listed as Threatened in 2014
Fish			
Bluehead sucker	*Catostomus discobolus*	Moved from Sensitive Species list to Other Species list	Species was removed from the Region 3 sensitive species list (2013).
Longfin dace	*Agosia chrysogaster*	Moved from Sensitive Species list to Other Species list	Species was removed from the Region 3 sensitive species list (2013).
Invertebrates			
A caddisfly	*Lepidostoma knulli*	Added	Added as a Forest Service sensitive species in 2013
A caddisfly	*Wormaldia arizonensis*	Added	Added as a Forest Service sensitive species in 2013

Common Name	Scientific Name	Change	Rationale
A mayfly	*Homoleptohyphes quercus*	Dropped from further consideration	Dropped as a Forest Service sensitive species in 2013. NatureServe conservation rank is G1G3Q SNR, validity of species is somewhat in doubt, and global ranking is preliminary (Feb. 2017)
A mayfly	*Moribaetis mimbresaurus*	Added	Added as a Forest Service sensitive species in 2013
Balmorhea saddle-case caddisfly	*Protoptila balmorhea,*	Added	Added as a Forest Service sensitive species in 2013
Four-spotted skipperling	*Piruna polingi*	Dropped from further consideration	Dropped as a Forest Service sensitive species in 2013. NatureServe conservation rank: G3 S3S4 (Feb 2017). NatureServe indicates this is the widespread subspecies and is locally very common. Stevens and Ledbetter (2014) indicate there is no evidence that population dynamics or viability are threatened regionally and that springfed meadows and creeks in its range appear to be sufficient to support species in its range.
Nitocris fritillary	*Speyeria nokomis nitocris*	Dropped from further consideration	Dropped as a Forest Service sensitive species in 2013. NatureServe conservation rank: G3T3S3 (Feb. 2017). NatureServe indicates species is probably not globally secure but not imminently imperiled. Most of its range in Huachuca and Chiricahua Mountains and Mogollon Rim. Probably more colonies in Arizona than elsewhere and can be locally common. Stevens and Ledbetter (2014): “appear to be relatively few impending threats to this species on the Mogollon Rim” and “species still appears to be relatively common in its range.”
Nokomis fritillary	*Speyeria nokomis nokomis*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. Stevens and Ledbetter (2014): subspecies “has not been reported in or near Coconino National Forest or in County. Its similarity to *S.n.nitocris* renders suspect any observational reports of it in the forest.”
Mammal			
Dwarf shrew	*Sorex nanus*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank: G4S1 (February 2017). NatureServe: “distributed locally from Montana and South Dakota to Arizona. Not known from many sites but may be result of difficulty in capture.” “No known threats”
Greater western mastiff bat	*Eumops perotis californicus*	Moved from Sensitive Species list to Other Species list	Species was removed from the Region 3 sensitive species list (2013).

Common Name	Scientific Name	Change	Rationale
Long-tailed vole	*Microtus longicaudus*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G5 S4 (March 2015).
Merriam's shrew	*Sorex merriami leucogenys*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G5 S3 (March 2015).
Plains harvest mouse	*Reithrodontomys montanus*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G5 S3 (March 2015).
Southwestern river otter	*Lutra canadensis sonora*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G5T1 SH (March 2015). Genetic swamping due to hybridization with introduced Louisiana river otter
Wupatki Arizona pocket mouse	*Perognathus amplus cineris*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe does not rank the subspecies. The species is ranked as G5S5.
Plant			
Apache beardtongue	*Penstemon oliganthus*	Dropped from further consideration	The species is ranked as G3SNR (Feb. 2017). Occurrences on forest are at edge of range.
Arizona phlox	*Phlox amabilis*	Moved from Other species to Sensitive species	Added as a Forest Service sensitive species for Coconino NF in 2013
Arizona whitefeather	*Ivesia arizonica var. arizonica*	Dropped from further consideration	The species is ranked as G3T3SNR (Feb. 2017)
Ertter's rose	*Rosa woodsii var. ertterae*	Added	Added as a Forest Service sensitive species in 2013
Grassy slope sedge	*Carex oreocharis*	Dropped from further consideration.	Ranked G3SNR (2015).
Jone's spider-flower	*Cleome lutea var. jonesii*	Dropped from further consideration	Ranked G5SNR (Feb. 2017)
Macoun's false bindweed	*Calystegia macounii*	Dropped from further consideration.	Ranked G5SNR (Feb. 2017). Not a native species.
New Mexico Alum-root	*Heuchera novomexicana*	Dropped from further consideration.	Ranked G3SNR (Feb. 2017)
Page Springs agave	*Agave yavapaiensis*	Added	Added as a Forest Service sensitive species in 2013
Rough Whitlow-grass	*Draba asprella* var. *asprella*	Dropped from further consideration	The species is ranked as G3T3S2
Rothrock's Hedge-nettle	*Stachys rothrockii*	Dropped from further consideration	The species is ranked as G3SNR (Feb. 2017)
Sacred Mountain agave	*Agave verdensis*	Added	Added as a Forest Service sensitive species in 2013

Common Name	Scientific Name	Change	Rationale
Silver milkvetch	*Astragalus subcinereus*	Dropped from further consideration	Ranked G3SNR in NatureServe. Restricted to the southwest where it occurs in northern Arizona, mostly north of the Grand Canyon, in Utah, Nevada with a few occurrences near Las Cruces. New Mexico. The occurrences on the forest are on the edge of the known range and represent only a small portion of the collections.
Timberland blue-eye-grass	*Sisyrinchium longipes*	Dropped from further consideration	The species is ranked as G3SNR (Feb. 2017)
Verde breadroot	*Pediomelum verdiensis*	Added	Added as a Forest Service sensitive species in 2013
Verde four-nerved daisy	*Tetraneuris verdiesis*	Added	The species is ranked as G1S1 (Feb. 2017). Omitted in DEIS by error
Western porterella	*Porterella carnosula*	Dropped from further consideration	The species is ranked as G4SNR (Feb. 2017)
Reptile			
Narrow-headed gartersnake	*Thamnophis rufipunctatus*	Moved from Sensitive species list to Federally listed species list	Species was listed as Threatened
Northern Mexican gartersnake	*Thamnophis eques*	Moved from Sensitive species list to Federally listed species list	Species was listed as Threatened
Reticulate Gila monster	*Heloderma suspectum suspectum*	Dropped from further consideration.	Species was removed from the Region 3 sensitive species list in 2013. NatureServe conservation rank is G4T4 S4 (March 2015).

Forest Ranks (or F-Ranks) were developed for each of the forest planning species. The ranking process generally followed the conventions used by NatureServe and others in defining State and Global Ranks. The F-Ranks were used in the viability risk assessment as a categorical variable representing a species' current abundance and distribution on the Coconino NF (Table C- 30). Rare species are often associated with rare habitats that would not become common with management.

Table C- 30. Description of F-ranks

F Ranking	Description
F1	Very rare on the forest within its habitat – occupies a very small portion of its habitat.
F2	Rare on the forest within its habitat – occupies a small portion of its habitat
F3	Uncommon on the forest within its habitat
F4	Common on the forest within its habitat
F5	Widespread and abundant on the forest within its habitat
F?	Present on the forest but abundance information is insufficient to develop risk
FP	Possibly could occur on the forest, but documented occurrences not known
FN	Occurs on the forest, but no breeding population is documented on the forest
FO	Occurs off the forest
FH	Occurred on forest historically, but no known extant populations

Following the identification of the forest planning species, a two-stage process, coarse filter and fine filter, was used to evaluate primary threats to species and their habitats and whether plan direction adequately provided for species viability. The coarse filter/fine filter process considered habitat (coarse filter) and species specific needs (fine filter). Species-specific plan direction was developed as needed and for those threats that the Forest Service could impact through management and which it has jurisdictional control.

Coarse filter: habitat

Habitat was evaluated based on abundance, distribution, and quality. Habitat abundance was assessed based on conditions found on national forest land. Habitat distribution was assessed considering the condition of intermixed ownerships and conditions, which may affect the interactions of species among suitable habitat patches on national forest lands.

Abundant and well-distributed habitat provides for the continued persistence of a species. Abundance is the amount of habitat on National Forest System lands. Unless otherwise indicated, we assumed that little change to the amount of habitat would occur over time. In some cases, the amount of suitable habitat (quality) acres can change such as when a large fire removes the entire forest overstory. Note that some habitats are naturally rare like riparian forests, or alpine tundra.

Abundance values (consisting of rare, occasional, and common) were used to categorize the projected abundance of each habitat after 15 years of implementing each plan alternative. Fifteen years is considered the life of the plan during which a trajectory for habitat improvement or protection would be set. Fifteen years was also considered the point in time for which vegetative modeling would most accurately reflect progress toward achieving desired conditions and the consequences of plan direction between alternatives could be reasonably compared.

Table C- 31. Values used to categorize projected abundance of each habitat element

Habitat Abundance Value	Description
Rare	The habitat (ERU or habitat element) is rare, with generally less than 100 occurrences, or patches of the element generally covering less than 1 percent of the national forest planning area.
Occasional	The habitat (ERU or habitat element) is encountered occasionally, and generally is found in 1 to 10 percent of the national forest planning area.
Common	The habitat (ERU or habitat element) is abundant and frequently encountered, and generally is found on more than 10 percent of the national forest planning area.

Values for habitat abundance and distribution are estimated for existing condition and the 15 year plan period with consideration of trend to 50 years for each habitat by alternative. The values are primarily based on treatment objectives (Table C- 32). For more information, see the sections on “Vegetation and Fire,” “Soil,” “Watersheds and Water,” “Riparian Areas,” “Biophysical Features,” in Volume I of the FEIS. Habitat quality may affect the movements and interactions of individuals among the suitable habitat areas found on National Forest System lands. This approach relies on the assumption that conditions similar to those that supported associated species during recent evolutionary history would likely contribute to their maintenance in the future, and the further a habitat departs from reference distribution and reference conditions, the greater the risk to viability of associated species.

Habitat distribution is expressed in terms of the mix of vegetation states or seral stages within an ERU. Habitat distribution can change with management, which is often the purpose of treatments. Habitat

distribution considered the condition of intermixed ownerships and conditions, which may affect the interactions of species among suitable habitat areas on National Forest System lands. Lands in other ownership within or surrounding the Coconino may contribute to, or hinder, maintenance of species viability on National Forest System land.

Future habitat abundance and future habitat distribution based on management and activities are qualitatively classified (Table C- 31). Future distribution is classified in terms of desired conditions; hence, while a habitat element may be common on the Coconino NF in the future, if it is still mostly departed from these conditions it would be considered poorly distributed.

Table C- 32. Values used to categorize distribution and quality of habitat and habitat elements

Value	Description of Habitat Distribution and Quality Values
Poor	High departure. The structure, composition, and or functioning of habitat is in poor condition relative to reference conditions. Number and size of habitat areas and /or their evenness in distribution across the landscape is greatly reduced.
Fair	Moderate departure. The structure, composition, and or functioning of habitat is in fair condition relative to reference conditions. Number and size of habitat areas and/or their evenness in distribution across the landscape is somewhat reduced.
Good	Low departure. The structure, composition, and/or functioning is similar to reference conditions. Number and size of habitat areas and /or their evenness in distribution across the landscape is similar to or only slightly reduced relative to reference conditions.

Likelihood of habitat limitation variable

Habitat abundance and quality values are combined to create one variable to indicate the general likelihood that the habitat would be limiting to populations of associated species on LRMP management and activities. This was done for each ERU and habitat element by alternative. The values are based on treatment objectives and mainly reflect the findings in the Vegetation/Fire, Riparian, Water, and Soil and other resources section in Volume I of the FEIS (Table C- 33). This “likelihood of limitation” was described as low, low-moderate, moderate, or high. In general, poor quality rare habitat would be more likely to increase the likelihood of risk to viability of associated species; good quality common habitat would be less likely to increase the risk to viability of associated species. In this general context, habitat could be limiting due to the abundance, distribution, or quality of habitat.

Table C- 33. Likelihood that habitat abundance and habitat quality will be a limiting factor to associated species

Habitat Abundance	Habitat Quality		
	Poor	Fair	Good
Rare	High likelihood that habitat would be a limiting factor for species viability	High likelihood that habitat would be a limiting factor for species viability	Moderate likelihood that habitat would be a limiting factor for species viability
Occasional	High likelihood that habitat would be a limiting factor for species viability	Moderate likelihood that habitat would be a limiting factor for species viability	Low likelihood that habitat would be a limiting factor species viability
Common	Moderate likelihood that habitat would be a limiting factor for species viability	Low-Moderate likelihood that habitat would be a limiting factor for species viability	Low likelihood that habitat would be a limiting factor for species viability

Species likelihood of limitation variable

Providing for species viability requires providing habitat (within the capacity of the forest) in a condition that allows existing populations to persist. The ability of existing populations to respond to available

habitat depends in part on the populations' current robustness, which is generally a function of size or the number of populations. The likelihood that a particular species would be limited by its habitat is also called the species likelihood of limitation and is a viability risk rating. The species likelihood of limitation outcomes for each species/habitat relationship were based on combining the species' F Rank with the associated habitats likelihood of limitation to generate this rating (Table C- 34). Viability risk categories are very high (VH), high (H), moderate-high (MH), moderate (M), low-moderate (LM), and low (L). Risk ratings of low to moderate are assumed to pose little risk to viability because they would fall within the natural range of variation in the environment. In general, for a given habitat condition, few small populations would be at greater risk than many widespread and abundant populations.

Table C- 34. Likelihood that individual species would be limited by its habitat

F Rank	Likelihood of Limitation			
	High	**Moderate**	**Low- Moderate**	**Low**
F 1 Very rare on the forest within its habitat – occupies a very small portion of its habitat.	Very High	High	Moderate-High	Moderate
F2 Rare on the forest within its habitat - occupies a small portion of its habitat	High	Moderate-High	Moderate-High	Moderate
F3 Uncommon on the forest within its habitat	Moderate-High	Moderate	Low-Moderate	Low
F4 Common on the forest within its habitat	Moderate	Low-Moderate	Low-Moderate	Low
F5 Widespread and abundant on the forest within its habitat	Low-Moderate	Low	Low	Low
F? ,FP, FN F? – present on the forest, but abundance information is insufficient to develop risk FP- possibly could occur on the forest, but documented occurrences not known FN – occurs on the forest, but no breeding population is documented on the forest	High	Moderate	Low-Moderate	Low
FH Occurred on the forest historically, but no known extant populations	High	Moderate	Low-Moderate	Low
FO Occurs off of the forest	Not Applicable	Not Applicable	Not Applicable	Not Applicable

As described above, associations of very rare species with habitat elements that are likely to be most limiting were identified as those most at risk; associations of more common species with habitats less likely to be limiting received lower risk ratings.

Management effect variable

This variable categorizes the relative expected outcome of plan language in each alternative in terms of minimizing species viability risk and are the result of plan decisions, including plan objectives. Management effect category values are 1, 2, 3, and 4. The lower the tally or number of management effects ratings for a species' associated habitat, the more effective the alternative is for that species viability. For example, a management effect of '4' under alternative A means that plan components may not exist or may be few and a decline in habitat quality as a result of management or lack management

that result from plan components could be expected. In contrast, a management effect of '2' under alternative B (modified) means that plan components maintain or improve habitat quality by maintaining or improving protection and management for most habitat and habitat elements and is more effective for species viability than alternative A (Table C- 35).

Table C- 35. Description of relative management effect rating

Management Effect Value	Description
1	Plan components provide optimal protection and management for **all** habitat and habitat element occurrences in the plan area. Quality of habitat or habitat elements is maintained or improved by providing protection, maintenance, and restoration to all or most occurrences (with limited exceptions). Where applicable, plan components address all identified fine filter species threats and needs in the plan area.
2	Plan components maintain or improve habitat quality by maintaining or improving protection and management for **most** habitat and habitat element occurrences in the plan area. Where applicable, plan components address the majority of identified fine filter species threats and needs.
3	Plan components maintain or improve protection and management for **some** habitat occurrences in the plan area. Quality of habitat or habitat elements is maintained or improved by providing protection, maintenance, and restoration to some occurrences. Where applicable, plan components address **some** identified fine filter species threats and needs.
4	Decline in habitat quality as a result of management or lack of management that result from plan components. Plan components may not exist or may be few. Where applicable, plan components address **few** identified fine filter species threats and needs.

Fine Filter Analysis

The fine filter analysis discusses finer scale species needs or concerns that are in addition to the coarse filter. Viability needs of species associated with the coarse filter habitat are generally met by improving, maintaining, or moving toward ERU or riparian area desired conditions. Standards and guidelines help meet the viability needs of species associated with fine filter habitat elements. However, the coarse-fine filter approach is not entirely discrete in that standards and guideline can contribute to viability for some coarse filter species, while the needs of fine filter species can also be provided for, in part, by the coarse filter desired conditions.

Habitat trends (away, static, slowly toward, toward) were also used to compare the estimated rate of change, or improvement, relative to plan components for each alternative. Vegetation trend was used most often because vegetation responds more rapidly to natural or human-caused disturbances than soil and changes in vegetation would be more likely to occur within the planning period due to treatments.

The likelihood that a particular species would be limited by its habitat is also called the species likelihood of limitation and is a viability risk rating. The species likelihood of limitation outcomes for each species/habitat relationship were based on combining the species F Rank with the associated habitats likelihood of limitation (table 9). Viability risk categories are very high (VH), high (H), moderate-high (MH), moderate (M), low-moderate (LM), and low (L). Risk ratings of low to moderate are assumed to pose little risk to viability because they would fall within the natural range of variation in the environment.

Assumptions for Wildlife, Fish, and Plants

- Fifteen years was the timeframe used for the species analysis because it is the life of the plan, and there is more certainty with the models within this timeframe.

- If a species is associated with a particular habitat, then the quality and quantity of habitat elements available to the species helps to predict its distribution and abundance within that habitat.
- Habitat abundance and distribution similar to that which supported associated species during conditions as a consequence of evolutionary time, will likely contribute to their maintenance in the future. Therefore, habitat abundance and distribution similar to reference conditions will likely contribute to associated species maintenance in the future and the farther a habitat departs from those conditions, the lower the likelihood that it is sustainable and the greater the risk to viability of associated species.
- Risks to some species are the same as the risks to the habitats in which they occur. It was assumed that actions to address the risks or departures in these habitats would benefit the species as well.
- Little change to the amount of habitat, or habitat abundance, has occurred between reference conditions and the present. In other words, the Cottonwood Willow Riparian Forest on the forest now was Cottonwood Willow Riparian Forest in reference conditions. Little change to the amount of cliffs on the forest has occurred since reference conditions, and because little management occurs on cliffs, little change to the quality of cliff habitat has occurred.
- In general, the farther a habitat is departed from desired conditions (i.e., from reference or reference adjusted conditions), the greater the risk to viability of associated species and the less the alternative's viability effectiveness. Conversely, the closer a habitat is to desired conditions, the lower the risk to viability of associated species and the greater the alternative's viability effectiveness.
- It was assumed that the states in the Ponderosa Pine Gambel Oak subtype were proportional to the states in the Ponderosa Pine ERU as a whole.

Information Sources

Information sources included but were not limited to:

- Species listed or ranked within various strategies, agreements, and lists such as NatureServe (http://www.natureserve.org),
- The Arizona State Wildlife Action Plan (SWAP) (Arizona Game and Fish Department 2012),
- The Museum of Northern Arizona, Arizona (Stevens and Ledbetter 2014),
- Partners in Flight Conservation Plan (Latta et al. 1999),
- Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2005),
- Western Bat Working Group priorities (www.wbwg.org),
- Arizona Bat Conservation Strategic Plan (Hinman and Snow 2003),
- Birds of Conservation Concern (USDI Fish and Wildlife Service 2008),
- Management Indicator Status Report for the Coconino National Forest (USDA Forest Service 2013a),
- Southwestern Regional Forester Sensitive Species List (USDA Forest Service 2013b),
- Arizona State Heritage Data Management System (Arizona Game and Fish Department 2016),
- Taxonomy books, field guides, journals, various publications, and
- Local, regional or national experts.

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Appendix D. Response to Comments

This appendix includes draft responses to the comments the Coconino National Forest (Coconino NF or the Forest) received on the Draft Land and Resource Management Plan (proposed revised plan or Forest Plan) and the Draft Environmental Impact Statement (DEIS) during the 90-day comment period that ended in March 2014. These draft responses to comments provide insight into how the forest addressed the comments and why adjustments were made to the proposed revised plan and alternative C. These responses are not final and may be adjusted as work continues on this effort. Final responses to the comments on the proposed revised plan and the environmental impact statement will be included in appendix D of the Final Environmental Impact Statement, which should be available in spring 2017.

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Introduction

This appendix documents the Coconino NF's responses to substantive comments received during the 90-day comment period for the Draft Land and Resource Management Plan (proposed revised plan) and Programmatic Draft Environmental Impact Statement. The proposed revised plan and Draft Environmental Impact Statement, along with supporting documents, were made available on the Coconino NF's website in late December 2013. Comments were considered substantive if they provided information to modify alternatives, evaluate new alternatives, improve or modify the analysis, and make corrections. Additional information about how substantive comments were identified is discussed in the Content Analysis Process section below. A notice of availability for the Draft Environmental Impact Statement was posted by the Environmental Protection Agency in the Federal Register on December 20, 2013. This notice initiated the comment period, which ended March 20, 2014. The Forest Service received comment letters or emails from individuals, organizations, and agencies; these comments were received by email, in person, and via the U.S. Post Office. A total of 1,788 comment letters, of which 95 contained unique and substantially different comments. In addition, there were 7 different form letters received. The original comments are included in the plan set of documents and are available at the Coconino NF's Forest Supervisor's Office, 1824 South Thompson Street, Flagstaff, Arizona. Electronic copies of the comment letters can be found in the project's Reading Room on the Forest's website at https://cara.ecosystem-management.org/Public/ReadingRoom?Project=32780.

Content Analysis Process

The comment content analysis followed a systematic process of reading, coding, and summarizing the comments that were submitted. This process ensured that every comment was read, analyzed, and considered.

Each unique letter was assigned a commenter code (see list of commenter codes at the end of this appendix). Each comment within a letter or email was assigned a unique comment tracking number and coded by subject and category. The unique commenter code followed by the comment tracking number can be found in parenthesis at the end of the concern statement (commenter code → 75-79 ← comment tracking number). For example, 75-79 would be comment number 79 of letter number 75. The comments and tracking spreadsheet are available in the plan set of documents.

Similar or identical comments were summarized into a single concern statement. Concern statements are meant to capture the thought, idea, or issue of the comment or common to all of the associated comments. They can represent the view of many respondents or may be derived from just one person's input. Concern statements are intended to aid the planning team in characterizing the issues to be analyzed in subsequent stages of the planning process. They also provide the framework for preparing responses to public comment. The concern statements are found in this appendix beginning in the next section.

The interdisciplinary planning team prepared responses for each concern statement based on its merits, regardless of the source or whether expressed by many people or by one person. This appendix documents the Coconino NF's responses to substantive comments, which are addressed as prescribed in 40 CFR § 1503.4 in the following ways:

- Modifying the proposed plan (alternative B) and alternatives;
- Developing or analyzing alternatives not given detailed consideration in the Draft Environmental Impact Statement;
- Supplementing, improving, or modifying the analysis that the Draft Environmental Impact Statement documented;
- Making factual corrections; and/or

- Explaining why the comments need no further agency response.

General Planning Topics

Alternatives

Concern Statement #65: The range of alternatives analyzed in the environmental impact statement is not adequate. (56-14, 81-9, 84-42)

Response: The environmental impact statement evaluates a range of reasonable alternatives. The alternatives considered in the environmental impact statement were developed to address the significant issues raised regarding the proposed revised plan. The Issues section in chapter 1 of the environmental impact statement describes the issues that generated the alternatives.

Chapter 2 of the environmental impact statement describes the alternatives developed in response to these issues. This chapter discusses the four alternatives that are analyzed in detail in the environmental impact statement. It also discusses the eight additional alternatives that were considered but dismissed from further evaluation in the environmental impact statement. Forest Service National Environmental Policy Act (NEPA) regulations at 36 CFR 220.5(e) state that "no specific number of alternatives is required or prescribed."

In addition to developing alternatives to the proposed revised plan, many suggestions for alternative management have been incorporated into the proposed revised plan over the course of this forest plan revision effort instead of developing a new alternative. The discussion on the alternatives in chapter 2 of the environmental impact statement provides information on how the proposed revised plan (alternative B) was developed iteratively in a collaborative manner to address the needs for change and comments from stakeholders. Furthermore, many adjustments to alternative B have been made in response to the comments received during the 90-day comment period on the Draft Environmental Impact Statement and proposed revised plan. These adjustments are also discussed in chapter 2 of the Final Environmental Impact Statement.

Some elements that are common to all of the alternatives were considered in detail. These elements are identified in the Elements Common to All Alternatives section in chapter 2 of the environmental impact statement. There are also measurable differences between the action alternatives in regard to plan components (desired conditions, objectives, standards, and guidelines), areas recommended as future wilderness, management areas, and suitability determinations on timber, recreation, and transportation. These differences include a range of environmental consequences. The tables at the end of chapter 2 of the environmental impact statement summarize the differences and similarities between the alternatives by comparing how the effects of each action alternative respond to the needs for change and issues identified in chapter 1.

Concern Statement #150: The Forest Service should discuss the successes and failures of the 1987 plan to determine what management actions will succeed in the future. (64-1)

Response: In preparation for plan revision, the Coconino NF identified guidance in the 1987 plan that is working, new conditions that need to be addressed, and ongoing challenges that could be better addressed. This preparatory work is documented in the "Analysis of the Management Situation," which was completed in May 2010 (USDA Forest Service 2010a). Through the Analysis of the Management Situation, the Coconino NF identified current ecological and socioeconomic conditions and trends taking place on the Forest and the associated "needs for change" to be addressed in the revised plan. The needs for change are grouped under three broad revision topics: (1) recreation, (2) forest-community interaction, and (3) maintenance and improvement of ecosystem health.

See the Needs for Change section in chapter 1 of the environmental impact statement and the Analysis of the Management Situation for additional information.

Concern Statement #684: The Forest Service should discuss the funding necessary to implement the alternatives; desired conditions will not happen without adequate funding. (64-3)

Response: The Socioeconomic Resources section in chapter 3 of the environmental impact statement describes the program costs (expenditures) by alternative. The action alternatives were developed to be realistic and able to be implemented within anticipated future budgets (expected to be similar to current budgets). Chapter 1 of the Forest Plan acknowledges that objectives to achieve desired conditions are strongly influenced by recent trends, past experiences, and anticipated staffing levels and short-term budgets.

Concern Statement #151: The Forest Service should consider an alternative that would provide a substantial increase in the protection for plant and animal species even at the expense of other resources. (84-96)

Response: Since this comment was received in 2010, many components have been added to the Forest Plan that would boost protection for plant and animal species and their habitat, and boost the consideration of climate change. Many of these components would apply to all alternatives except alternative A, the current plan as amended. Examples of some of the plan components that support wildlife and plant species, including endemic species, and their habitat are found in the sections on All Ecosystems, Watersheds and Water, Stream Ecosystems, Wetlands, Riparian Forests, Desert Communities, Springs, Alpine Tundra, Wildlife, Fish, and Plants, Invasive Species, Designated Wilderness and Recommended Wilderness. See FW-Eco-DC-4, FW-BioPhys-Geo-DC-3, FW-BioPhys-Geo-G-7, FW-Rip-Spr-DC-2 and 5, FW-Rip-Spr-G-3 and 4, FW-TerrERU-DC-DC-4, FW-TerrERU-AT-DC-2, MA-InBsn-DC-3, FW-WFP-DC-1 to 11, FW-WFP-O-1 to 5, FW-WFP-S-1 and 2, FW-WFP-G-1 to 16, FW-Water-DC-6, FW-Water-G-6, FW-Rip-Strm-G-1, FW-Rip-Wtlnds-DC-1 and 2, FW-Rip-RipType-DC-2, FW-Rip-RipType-G-2; FW-Invas-DC-1 and 2, FW-Invas-G-1, 2, and 3, SA-Wild-DC-3, and SA-RWild-DC-3.

Examples of resiliency, adaptation to change, and consideration of climate change are addressed in FW-Eco-DC-1, FW-Water-DC-1, 3, FW-Water-G-2, FW-Soil-DC-2, FW-TerrERU-All-DC-1 and 4, FW-TerrERU-PP-DC-2, FW-TerrERU-MC-MCFF-DC-4, FW-TerrERU-MC-MCIF-DC-4, FW-TerrERU-SF-DC-4, FW-TerrERU-AT-DC-1, FW-WFP-DC-6, and MA-InBsn-DC-1.

In addition, alternative C was developed to respond to suggestions for more land to be managed in primitive and natural settings with reduced human-related disturbance for the benefit of recreation, botanical, and wildlife resources. Under this alternative, additional wilderness areas would be recommended on the Forest. Also eight management areas were incorporated that reduce public motorized access into certain areas. Alternative C also recommends the addition of a botanical area adjoining the Cottonwood Basin Geological Area (which has also been incorporated into alternative B (modified)), prohibits livestock grazing in research natural areas, and recommends restrictions on recreational shooting and snowmobiling in certain areas. Alternative C also responds to ecological concerns related to the distribution and presence or absence of old-growth composition and structure on the landscape.

Alternative A

Concern Statement #617: Some commenters supported or rejected all or portions of alternative A. (69-32, 69-36)

Response: Alternative A is the 1987 plan and has been included in the environmental impact statement as the "no-action" alternative. Alternative A is described in chapter 2 and analyzed in chapter 3 of the environmental impact statement. The no-action alternative generally serves as a baseline to which the effects of the proposed action and other alternatives can be compared. To preserve that role in the environmental analysis, no changes have been made to alternative A. The rationale for the selection of the selected alternative and the final plan are described in the record of decision document.

Alternative B

Concern Statement #599: Some commenters supported or rejected all or portions of alternative B. (44-3, 44-4, 44-5, 48-15, 56-94, 69-33, 69-37, 71-6)

Response: Alternative B is the proposed action; it includes the proposed revised plan that was developed to address the needs for change that were identified for the 1987 plan. Alternative B is described in chapter 2 and analyzed in chapter 3 of the environmental impact statement. In response to public comments, several adjustments were made to this alternative. These adjustments are discussed in the "Addressing Concerns Raised During the 90-Day Comment Period" section for Alternative B - Proposed Revised Plan in chapter 2 of the Final Environmental Impact Statement. The adjustments included reorganization of plan components to make the Forest Plan easier to use; removal of redundant plan components and direction already covered by law, regulation, and policy; clarification of plan components; and inclusion of elements from alternatives C and D. To acknowledge these adjustments, this alternative is now referred to as "alternative B (modified)."

The rationale for the selection of the selected alternative and the final plan are described in the record of decision document.

Alternative C

Concern Statement #598: Some commenters supported or rejected all or portions of alternative C. (11-1, 11-5, 13-1, 14-1, 17-1, 48-2, 48-5, 48-14, 49-2, 51-2, 56-170, 56-195, 69-34, 69-38, 71-1, 73-2, 75-38, 75-40, 75-41, 75-44, 77-4, 86-57, 86-58, 86-64, 94-4)

Response: Alternative C was developed to respond to public comments on the proposed revised plan (alternative B) that suggested more land should be managed in primitive and natural settings with reduced human-related disturbance for the benefit of recreation, and botanical and wildlife resources. Alternative C is described in chapter 2 and analyzed in chapter 3 of the environmental impact statement. In response to public comments, an editorial adjustment was made to several of the management areas in this alternative. The term "Wildlife Habitat" was removed from the names of the Hospital Ridge, Jack's Canyon, Knoll Lake, Limestone Pasture, Pine Grove, Second Chance, and Anderson Mesa management areas. In addition, the East Clear Creek Wildlife Habitat Management Area was renamed the Blue Ridge Management Area. However, no plan components included in the management areas being added by alternative C were changed.

Alternative C shares many plan components with alternative B. In response to public comments, several adjustments were made to alternative B. These adjustments are discussed in the "Addressing Concerns Raised During the 90-Day Comment Period" section for Alternative B - Proposed Revised Plan in chapter 2 of the Final Environmental Impact Statement. The adjustments included reorganization of plan

components to make the Forest Plan easier to use; removal of redundant plan components and direction already covered by law, regulation, and policy; clarification of plan components; and inclusion of elements from alternatives C and D. To acknowledge these adjustments, this alternative is now referred to as "Alternative B (modified)."

The rationale for the selection of the selected alternative and the final plan are described in the record of decision document.

Concern Statement #140: The Forest Service should either adjust the unique "Wildlife Habitat Management Areas" in Alternative C to provide actual management to restore and improve habitats or change the name of the management areas because other than removing motorized use these management areas do nothing to actively manage wildlife habitat. (48-4, 48-6, 75-156, 75-157)

Response: Alternative C has been adjusted in response to these comments. Alternative C responds to concerns that the forest plan revision effort needs to consider management options that would reduce impacts associated with motor vehicles and provide more primitive and natural settings with reduced human-related disturbance. One of the reasons for this emphasis is to benefit wildlife. One way that alternative C responded to this concern was the inclusion of management areas that have an emphasis on reducing impacts associated with motor vehicles and provide more primitive and natural settings with reduced human-related disturbance. The management areas unique to alternative C included the term "wildlife habitat" in their name to help identify them. Naming the management areas in this manner has created confusion, so the term wildlife habitat has been removed from the names.

Alternative C's emphasis to provide more primitive and natural settings with reduced human-related disturbance has been retained. This provides the Forest with the opportunity to analyze and disclose the effects on a broader range of alternatives.

Concern Statement #323: The Forest Plan should not contain the "Wildlife Habitat Management Areas" included in alternative C because the Forest does not have authority to designate areas for that purpose and the areas were developed without proper coordination with the Arizona Department of Game and Fish. (48-7, 75-39, 75-134, 75-135, 75-139, 75-155)

Response: Alternative C has been adjusted in response to this comment. Alternative C responds to concerns that the forest plan revision effort needs to consider management options that would reduce impacts associated with motor vehicles and provide more primitive and natural settings with reduced human-related disturbance. The term "wildlife habitat" was not included to suggest that these areas were being designated as "special areas." Special areas are addressed in the Special Areas section in chapter 3 of the Forest Plan. Naming the management areas in this manner created confusion, so the term "wildlife habitat" has been removed from the names. These management areas are still located in the Management Areas section in chapter 3 of the Forest Plan.

Alternative C's emphasis to provide more primitive and natural settings with reduced human-related disturbance has been retained. This provides the Forest with the opportunity to analyze and disclose the effects on a broader range of alternatives.

Concern Statement #482: The Forest Service should not develop wildlife habitat management areas without coordinating with the Arizona Game and Fish Department. (75-158, 1787-2)

Response: The Forest Service acknowledges that the Wildlife Habitat Management Areas included in alternative C were not developed in coordination with the Arizona Game and Fish Department. The Wildlife Habitat Management Areas were included in alternative C to respond to issues the public raised

during scoping on the proposed revised plan related to noise disturbance and habitat connectivity for wildlife.

Concern Statement #536: The Forest Service should not include the Wildlife Habitat Management Areas discussed in alternative C in the Forest Plan. Had such restrictions imposed by alternative C been effective, the Wildlife Refuge System developed by the Arizona Game and Fish Dept. in cooperation with the US Forest Service in the 1930s-40s would have proven it a valuable technique. (77-6, 94-6)

Response: No change has been made in the Forest Plan in response to this comment. The management areas in alternative C that were designed to provide more primitive and natural settings with reduced human-related disturbance have not been included in the Forest Plan.

These management areas have been retained in alternative C. They have been included in that alternative to respond to concerns that the forest plan revision effort needed to consider management options that would reduce impacts associated with motor vehicles and provide more primitive and natural settings with reduced human-related disturbance. Including these management areas in alternative C provided the Forest with the opportunity to analyze and disclose the effects on a broader range of alternatives.

Concern Statement #539: The Forest Service should not select alternative C because the benefits to wildlife are overstated and largely speculative. (75-42, 75-43)

Response: No change has been made in the Forest Plan in response to this comment. Alternative C responds to concerns that the forest plan revision effort needs to consider management options that would reduce impacts associated with motor vehicles and provide more primitive and natural settings with reduced human-related disturbance. One of the reasons for this emphasis is to benefit wildlife.

Alternative C's emphasis to provide more primitive and natural settings with reduced human-related disturbance has been retained. This provides the Forest with the opportunity to analyze and disclose the effects on a broader range of alternatives.

Concern Statement #703: The Forest Service should acknowledge the underlying assumptions and uncertainties of wildlife benefits associated with the Wildlife Habitat Management Areas in alternative C. (75-159)

Response: The anticipated effects to wildlife associated with the management areas that emphasize reduced human-related disturbance (formerly titled “Wildlife Habitat Management Areas”) are discussed in the Wildlife section in chapter 3 of the environmental impact statement. There is no general statement about assumptions or uncertainties related to benefits to wildlife because the potential effects can vary by species and management area. Accordingly, the discussion of assumptions and uncertainties associated with the impacts of reduced human-related disturbance to wildlife in these management areas is discussed in the analysis on alternative C. For example, the analysis on the black-footed ferret in the environmental impact statement describes how plan language under alternative C could affect the black-footed ferret and its habitat within these management areas.

Concern Statement #390: The Forest Service should not incorporate old-growth standards from the current plan into alternative C because those standards are not supported by current science. (48-12, 75-45)

Response: Under alternative C, the standards and guidelines for old growth set forth in the current 1987 plan, as amended in 1996, would be carried forward into the new plan. In ponderosa pine and mixed conifer forests, the emphasis under the 1987 plan is placed on creating and maintaining large stands (100 to 300 acres) or large aggregations of contiguous stands that all have the full suite of old-growth

characteristics (1987 plan, pages 70-2, 129, 138). The effects of this proposed plan direction is fully considered in the Vegetation and Fire Specialist Report (USDA Forest Service 2016a). Generally, within the ponderosa pine and mixed conifer forests, the 1987 plan direction would encourage a forest structure that does not match the historic condition or the desired conditions. Larger areas with a closed canopy and a more even-aged structure would occur across the landscape. While this structure is not supported by the best available science specific to southwestern frequent fire forests (Reynolds et al. 2013), these standards and guidelines were carried forward into alternative C in response to stakeholder input and to provide an opportunity to analyze the effects of incorporating these old plan components into the proposed revised plan.

Concern Statement #469: The Forest Plan should not include the transportation suitability determination from alternative C. (71-5)

Response: No change has been made in response to this comment. The transportation suitability determination that is the topic of this comment is part of alternative C. It was included in and analyzed as part of that alternative to respond to concerns that the forest plan revision effort needed to consider management options that would reduce impacts associated with motor vehicles. Including this topic in alternative C provided the Forest with the opportunity to analyze and disclose the effects on a broader range of alternatives.

The transportation suitability determination in alternative C is not part of the Forest Plan. Furthermore, specific decision on the Forest's transportation system are not made in the Forest Plan, but at a project level, through the travel management process. The travel management process provides analysis on proposed changes to the motorized transportation system.

Concern Statement #579: The Forest Service should adjust the Recreation Opportunity Spectrum (ROS) modeling for alternative C. In the management areas that emphasize reduced human-related disturbance, the areas modeled as semi-primitive non-motorized should be reclassified as semi-primitive motorized (48-3).

Response: The ROS modeling for alternative C has not been adjusted as suggested. It is true that the ROS modeling for alternative C reflects the presence of the management areas that emphasize reduced human-related disturbance. However, the presence of these management areas is not the only factor that is taken into account for ROS modeling, so simply reclassifying the areas modeled as semi-primitive non-motorized as semi-primitive motorized is not appropriate. Furthermore, such a reclassification is unnecessary. Neither alternative B (modified) nor alternative D include the management areas that emphasize reduced human-related disturbance. The ROS modeling conducted for those alternatives reflects the appropriate ROS classification to apply when these management areas are not considered in the modeling. Accordingly, the modeling for those alternatives will be used if the management areas that emphasize reduced human-related disturbance are not part of the Forest Plan.

Alternative D

Concern Statement #597: Some commenters supported or rejected all or portions of alternative D. (69-35, 69-39, 74-109)

Response: Alternative D is described in chapter 2 and analyzed in chapter 3 of the environmental impact statement. Alternative D shares many plan components with alternative B. In response to public comments, several adjustments were made to alternative B. These adjustments are discussed in the "Addressing Concerns Raised During the 90-Day Comment Period" section for Alternative B - Proposed Revised Plan in chapter 2 of the Final Environmental Impact Statement. The adjustments included reorganizing plan components to make the Forest Plan easier to use; removing redundant plan

components and direction already covered by law, regulation, and policy; clarifying plan components, and including elements from alternatives C and D. To acknowledge these adjustments, this alternative is now referred to as "alternative B (modified)."

The rationale for the selection of the selected alternative and the final plan are described in the record of decision document.

Editorial, Technical

Concern Statement #686: Some commenters identified editorial problems and technical inaccuracies or inconsistencies in the Draft Environmental Impact Statement. (18-1, 20-1, 21-3, 33-2, 45-1, 56-30, 56-57, 75-30, 75-102, 75-133, 75-144, 75-145, 75-146, 75-147, 75-150, 84-61, 86-67)

Response: The environmental impact statement has been adjusted in response to these comments. Either the suggested edit was made or the environmental impact statement was adjusted in another manner to address the editorial problem or inconsistency.

The document has been thoroughly reviewed and put in an approved format for publications of this nature. Measures and topics used to compare alternatives have been reviewed for consistency and relevance. Missing or incomplete citations have been identified and corrected. A uniform system has been applied to citations referenced in the document.

Concern Statement #643: The description of desired conditions in the Plan Decisions section in chapter 1 of the Forest Plan appears to be focused on projects. Is it intended to apply to other activities? (44-6)

Response: The Forest Plan has been adjusted in response to this comment. The discussion on desired condition in the Plan Decision section in chapter 1 of the Forest Plan has been adjusted to clarify that desired conditions apply to projects and activities that are taking place on the Forest.

Concern Statement #644: The description of objectives in the Plan Decisions section of Chapter 1 of the Forest Plan should be modified to state that objectives are measureable, anticipated results "that help achieve desired conditions," not "respond to desired conditions." (44-7)

Response: The Forest Plan has been adjusted in response to this comment. The discussion on objectives in the Plan Decisions section in chapter 1 of the Forest Plan has been modified as suggested.

Concern Statement #166: The Forest Service should include citations or references in the revised plan. For example, some of the desired condition statements reflect information in General Technical Report RMRS-GTR-310 but it is not referenced. (65-5)

Response: In general, plan components do not contain in text citations. General Technical Report RMRS-GTR-310 has been added to the References section of the revised Plan. Information on the role of General Technical Report RMRS-GTR-310 in the development of the desired conditions for the Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs has been add to the General Description and Background for the All Terrestrial ERUs section.

Concern Statement #333: The Forest Plan should not use different terms interchangeably. For example, sometimes the Forest Plan appears to use the term "openings" interchangeably with the term "interspace." In other cases, the term "openings" is used to describe forest openings like meadows and grassland. (65-2)

Response: The Forest Plan has been reviewed and adjusted to ensure consistent usage of terms throughout the document. Particular attention was paid to the use of "openings" and "interspaces." To

further clarify the meaning and use of these terms, a definition for "interspaces" has been added to the Glossary in the Forest Plan and the definition for “openings” has been adjusted.

Concern Statement #334: The Forest Plan should use similar language when the plan component is specifically referencing consistency with desired conditions. Use the phrase “maintaining or making progress toward achieving” desired conditions in those plan components. (58-3)

Response: The discussion on desired conditions in chapter 1 of the Forest Plan has been adjusted to clearly state that maintaining or making progress toward a desired condition is one of the ways that a project or activity can demonstrate that it is consistent with the desired condition. This concept has been included in many guidelines throughout the Forest Plan. For example, see FW-Rip-All-G-1 and FW-TerrERU-All-G-1.

Concern Statement #335: The Forest Plan should provide additional detail to allow the reader to know what is meant by “intact and functioning,” as it relates to meeting desired conditions. For example, “Endemic rare plant communities are intact and functioning” (see Draft Revised Plan FW-Veg-All-DC-13) does not, without additional information, allow the reader to know what is meant by “intact and functioning.” (65-4)

Response: The Forest Plan has been reviewed and whenever possible additional specificity has been added to the desired conditions. For example, the specific component being commented on has been merged with another component in the Wildlife, Fish, and Plants section to provide better context for these terms. See FW-WFP-DC-5.

Concern Statement #338: The definition of “livestock utilization” in the Glossary of the Draft Revised Plan seems incomplete based upon definitions used in Forest Service Environmental Assessments and other documents. This definition should be modified to match what has been used in other documents. (86-50)

Response: The guideline that used the term “livestock utilization” (see Draft Revised Plan FW-Veg-Rip-All-G-3) has been edited and no longer uses the phrase “livestock utilization.” Because the phrase no longer occurs in the Forest Plan, it has been removed from the Glossary. As part of the editing referenced above, this guideline has been moved from the Riparian section to the Livestock Grazing section because the plan component only applies to management of livestock grazing. See FW-Graz-G-7.

Concern Statement #339: The Forest Plan should include the Tier 1a and 1b species from Arizona Game and Fish Department's Statewide Wildlife Action Plan in the definition of “special status species.” (86-52)

Response: The definition of “special status species” has not been adjusted as suggested. Adding all of the Tier 1a and 1b species from Arizona Game and Fish Department's Statewide Wildlife Action Plan to the definition would have caused the plan components that used the term “special status species” to have broader application than intended. After consideration of this comment, this term was removed from the Forest Plan. In its place, the components were edited to reference the species or group of species (threatened, endangered, sensitive, aquatic, etc.) on which the component was intended to apply. Tier 1a and 1b species were considered during the development and the refinement of the forest planning species list that is described in the Final Environmental Impact Statement.

Concern Statement #509: The Forest Plan should define the term “natural waters” and should provide details on how they would be maintained. (58-6)

Response: The Forest Plan has been adjusted in response to this comment. The direction included in the guideline related to natural waters has been merged with several other components’ similar direction

related to management of water sources and access to water sources. See FW-WFP-G-5, FW-Graz-6, FW-ConstWat-DC-2. The term "natural waters" is no longer used in any plan component.

Concern Statement #541: The Forest Plan and environmental impact statement should use the term "pronghorn" instead of "antelope." (23-2, 33-1, 34-3, 86-31)

Response: The Forest Plan and the environmental impact statement have been adjusted in response to this comment. All references to "antelope" have been replaced with "pronghorn."

Concern Statement #709: The Forest Service should define the phrase "antelope protection goals" or remove it from the environmental impact statement. (34-1)

Response: As indicated in the environmental impact statement, the reference to "antelope protection goals" is highlighting existing direction from Management Area 27 (Savannah) in the 1987 Forest Plan. As the narrative in the environmental impact statement acknowledges, the guidance in this management area emphasizes pronghorn and its habitat and many of the pronghorn-specific objectives and guidelines included in this management area are listed. Antelope protection goals is a broad phrase that encompasses wildlife objectives such as the acquisition of "certain private parcels to reduce habitat fragmentation and otherwise improve antelope and grassland species habitat"; using "prescribed fire and other mechanical treatments to improve forage conditions for wildlife, particularly birds and antelope"; "develop conditions that improve and expand antelope and grassland bird habitat through such means as fence, road, fire and human access management"; "provide adequate cover/security for animal shelter and foraging"; "identify and protect antelope fawning areas" as well as guidelines 1, 2, and 3, which provide direction for fence locations, road locations, and open grassland habitat.

Concern Statement #544: The Forest Plan should refer to buffalo by its common name, bison. (85-34)

Response: The Forest Plan has been adjusted in response to this comment. A parenthetical mention to "bison" has been added to the two references to "buffalo" in the Forest Plan.

Concern Statement #358: The Four Agency Partnership between ADOT, the Federal Highway Administration (FHWA), the US Forest Service (USFS) and the Bureau of Land Management (BLM) was established to provide a framework for the agencies to actively and effectively cooperate with each other throughout the planning, design, construction and maintenance of highway corridors. The process is formalized in a Memorandum of Understanding (MOU) between USFS, FHWA, and ADOT and in the 2008 manual: Guidelines for Highways on BLM and USFS Lands and 2011Supplement: Guidelines for Long-Range Planning, which are available on the ADOT website (see references at end of letter). This manual describes accepted procedures, as well as the needs and concerns of each agency in an effort to minimize conflict and facilitate the creation of safe, environmentally sound and aesthetically pleasing highway corridors. (83-1)

Response: References to the guidelines for highways and the memorandum of understanding have been added to appendix D, Other Sources of Information, of the Forest Plan.

Concern Statement #558: The Forest Plan should clarify what resources the Energy and Minerals section applies to and identify potential energy corridors. (82-21)

Response: The Forest Plan has been adjusted in response to this comment. To clarify that the Energy and Minerals section addressed mineral energy sources (oil, gas, geothermal) and mining, it has been renamed the Minerals and Mining section. Utilities and energy distribution are still addressed in the section titled Land Special Uses.

The Forest Plan does not identify potential energy corridors. Rather, it includes plan components for utility corridors and the resources that could be impacted by utility corridors. These plan components for a framework that will guide any proposals to develop energy corridors on the Forest.

Concern Statement #602: The Forest Plan should ensure consistency between the high-priority private parcels listed in the plan components and the parcels included on the map of high-priority private parcels. The Cockscomb area is identified as High-priority Acquisition Land on Map 13 of the Draft Revised Plan, but it is not specifically listed in the text of the Sedona-Oak Creek Management Area standard that restricts land exchanges to specifically identified high priority private parcels (see Draft Revised Plan MA-SedOak-S-8). (74-99)

Response: The Forest Plan has been adjusted in response to this comment. The Cockscomb area has been removed from the map that identifies the base-for-exchange priority acquisition lands. See map 11 of the Forest Plan. The remaining high priority parcels listed in the Red Rock Management Area standard (Lincoln Canyon and Hancock Ranch, see MA-RedRock-S-8) match the parcels identified on map 11.

Concern Statement #614: The Forest Plan and the environmental impact statement should use the proper name for the Sunset Crater Volcano National Monument. (86-65)

Response: The Forest Plan and environmental impact statement have been adjusted in response to this comment. All references to the Sunset Crater Volcano National Monument have been checked to ensure the proper name is being used.

Concern Statement #695: The Forest Service should acknowledge that the Sunset Crater Volcano National Monument was established for the protection of formations of scientific and public interest, not the interpretation of the prehistoric Sinagua culture. (86-66)

Response: The environmental impact statement has been adjusted in response to this comment. The environmental impact statement indicates that the Sunset Crater Volcano National Monument was established for the protection of geologic formations of scientific and public interest.

Concern Statement #624: The Forest Plan should be adjusted to remove duplicate language related the unique geology and local rock formations in the desired conditions for the Sedona/Oak Creek Management Area (see Draft Revised Plan MA-SedOak-DC-9). (74-93)

Response: The Forest Plan has been adjusted in response to this comment. The language in this desired condition is from the Landscape Character Descriptions that were developed under the Scenery Management System. The landscape character descriptions are not desired conditions in the Revised Plan; scenic integrity objectives are the desired conditions. Landscape character descriptions are one of several components that the scenery management system uses to determine if assigned scenic integrity objectives are being met. The landscape character description language has been removed from this desired condition, as with scenery desired conditions in other management areas. The General Description and Background section for the Red Rock Management Area reminds the reader that this management area is within the Red Rock Landscape Character Zone. The complete landscape character description for the Red Rock Landscape Character Zone can be found in the document titled Landscape Character Descriptions, Coconino National Forest in the project record and on the Forest website.

Scenic integrity objectives are addressed in a forestwide desired condition. See FW-Scenic-DC-2. The map referenced in FW-Scenic-DC-2 includes desired scenic integrity objectives for the Red Rock Management Area. The desired scenic integrity objectives for the Red Rock Management Area are incorporated by reference to the scenic integrity map and FW-Scenic-DC-2. See MA-RedRock-DC-10.

Concern Statement #627: The Forest Plan should remove references to the Redrock Trails Plan and the Sedona Urban Trails and Pathway Plan. (52-2)

Response: The Forest Plan has been adjusted in response to this comment. The management approach that referenced the Redrock Trails Plan and the Sedona Urban Trails and Pathway Plan has been removed from the Forest Plan. The concept of working with the City of Sedona and other municipalities during trail planning efforts is still addressed in the Forest Plan. A management approach in the Trails and Trailheads section reminds forest managers to:

> Collaborate with county and city trails coordinators, local groups, and area residents, when conducting trail planning. Consider needs for non-motorized and motorized trails and provide opportunities for both.

Concern Statement #628: The Forest Plan should identify the City of Sedona on figure 3, the map depicting the Coconino NF and the surrounding lands. (52-1)

Response: The Forest Plan has been adjusted in response to this comment. The City of Sedona has been added to figure 3 in the Forest Plan.

Concern Statement #685: The Forest Service should consider an alternative that designates a National Scenic Area in the Sedona-Oak Creek Area and acknowledge that the agency expressed support for legislation on the establishment of a National Scenic Area in the Sedona-Oak Creek Area in 2012. (19-1, 74-13, 92-1)

Response: Designating the Sedona-Oak Creek area was considered as an alternative in this plan revision effort. The Alternatives Eliminated from Detailed Study section in chapter 2 of the Draft Environmental Impact Statement explains that the alternative was not carried forward for detailed consideration because the land adjustment plan direction that was central to previously proposed national scenic area legislation and the values sought through such a designation have been incorporated into the proposed action and the other alternatives. The Final Environmental Impact Statement has been adjusted to recognize that in 2012 the Forest Service expressed support on a specific legislative effort to create a National Scenic Area in the Sedona-Oak Creek area.

Concern Statement #711: The Forest Service should specifically refer to power lines when discussing fuels reduction treatments in wildland-urban interface. (43-7)

Response: The environmental impact statement has been adjusted in response to this comment. To clarify that wildland-urban interface includes high voltage transmission lines, the discussion in chapter 2 of the environmental impact statement has been expanded to specifically acknowledge that high voltage transmission lines are considered part of the wildland-urban interface. Furthermore, a definition for the term "wildland-urban interface" has been added to the Glossary for the environmental impact statement. The definition specifically acknowledges that high voltage transmission lines are considered part of the wildland-urban interface. The effects of the alternatives on management of the wildland-urban interface are discussed in the Fire Management section in chapter 3 of the environmental impact statement.

Concern Statement #714: The Forest Service should edit the Recreation Opportunity Spectrum maps included in the environmental impact statement to ensure that the symbology listed in the map legends matches the symbology applied to the maps. (74-110)

Response: The Recreation Opportunity Spectrum maps have been reviewed and adjusted to ensure that the symbology included in the map legends matches the actual symbology in the maps. See maps 4, 5, 6, and 7 in the Final Environmental Impact Statement.

Concern Statement #716: The Forest Service should be more specific regarding references to pinyon trees. What species of pinyon are being addressed in the various pinyon juniper ecological response units? (22-2)

Response: The common names of the particular pinyon pine being referenced have been included in the descriptions of the Pinyon Juniper ERU in both the Forest Plan and the environmental impact statement. Appendix C in the Forest Plan provides a crosswalk comparing the common, scientific, and other names attributed to the plant and wildlife species discussed in the Forest Plan.

Glossary

Concern Statement #336: In the revised plan, the Forest Service should include citations or the sources of definitions with the word being defined in the glossary. (86-46)

Response: Citations have been added to glossary definitions as appropriate.

Concern Statement #22: The Forest Service should consider modifying the definition of Wildland Urban Interface in the glossary of the revised plan to include the term "municipal water supplies" if this term is distinct from the term "municipal watersheds." (78-3)

Response: The definition of wildland-urban interface (WUI) has been adjusted based on your suggestion. The term "municipal watersheds" has been replaced with "critical sites for water supply" to expand the areas covered by the term, wildland-urban interface.

Concern Statement #165: The document should have a link with definitions for terms (see Kaibab Forest Plan) and terms like "interspace" should be used consistently. (65-3)

Response: All words included in the glossary for the revised Plan have been hyperlinked on their first occurrence in the document. Definitions for "interspaces" and "openings" have been added to the glossary. The revised Plan has been edited to use those terms in their proper context.

Concern Statement #167: The Forest Service should add the terms "fire interval" and "fire rotation" to the glossary of the revised Plan. (86-47)

Response: No change has been made to the Glossary in the revised Plan because neither of these terms is used in the revised Plan. These terms are used in the Final Environmental Impact Statement and have been added to the Glossary for that document.

Concern Statement #168: In the revised plan, the Forest Service should include more information in the definition of 'free thinning' because this phrase has been confusing in past discussions with the public. The information could include the objectives of free thinning, and what it is and what it is not. A suggested definition of "free thinning" is provided. (86-49)

Response: The two objectives that mentioned "free thinning" have been edited to remove the term. See FW-TerrERU-MC-MCFF-O-1 and FW-TerrERU-PP-O-1. Because the term is no longer used in the revised Plan, it has not been added to the Glossary. Although "free thinning" is not referenced in the revised Plan, it remains a legitimate silvicultural cutting and actually best describes many of the wildland-urban interface fuel treatments that have been done historically in the region.

Concern Statement #169: The Forest Service should consistently refer to goshawks as northern goshawks in the revised plan. (86-51)

Response: All references to "goshawk" in the revised plan have been changed to "northern goshawk."

Concern Statement #170: The Forest Plan should adjust the definition of "viability" used in the Glossary of the Forest Plan. Species can be viable and be very narrowly distributed, but the definition seems to suggest that species need to be distributed over wide geographical limits. (86-53)

Response: The term "viability" no longer occurs in the main chapters of the revised plan. The definition has been removed from the Glossary.

Concern Statement #212: The Forest Plan and environmental impact statement should include definitions for "restoration," "sustainable," and "resilience." (75-61, 84-67)

Response: The following definition for the term "restoration" has been added to the Glossary in both the Final Environmental Impact Statement and the Forest Plan. It states that restoration is:

> The process of assisting in the recovery of an ecosystem that has been degraded, damaged, or destroyed (Society for Ecological Restoration International 2004). Ecological restoration focuses on establishing or re-establishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystem sustainability, resilience, and health under current and future conditions. Accordingly, any project or activity that assists in the recovery of a degraded, damaged, or destroyed ecosystem can be considered restoration. Restoration can be active or passive. Treatments that move ecosystem components toward desired conditions are considered restoration as are removal of impacts. Allowing natural processes to move ecosystem components toward desired conditions can also assist in the recovery of an ecosystem. General Technical Report RMRS-GTR-310 provides a framework for restoration of ponderosa pine and mixed conifer with frequent fire (Reynolds et al. 2013).

The definition for "sustainability" and "resiliency" included in the proposed revised plan has been carried forward in the Final Environmental Impact Statement and the Forest Plan.

Concern Statement #337: The definition of "forage" used in the Glossary of the Draft Revised Plan should be modified. The definition refers to forage as "all browse and non-woody plants that are available to livestock or game animals for grazing or harvesting or feeding." "Game animals" should be changed to "wildlife." There are many wildlife species that are not game animals that use forage. (86-48)

Response: The definition of the term "forage" in the Glossary for the Forest Plan has been adjusted to reflect that grazing animals can be domestic or wild.

Concern Statement #340: The definition for "wildlife corridors" in the Forest Plan should be enhanced. (86-54)

Response: In response to this comment, the definition for "wildlife corridors" in the Glossary for the Forest Plan has been modified and enhanced as follows:

> A link of wildlife habitat, generally native vegetation, which joins two or more larger areas of similar wildlife habitat or habitat needed seasonally (such as summer and winter range). Corridors are critical for the maintenance of ecological processes including allowing for the movement of animals and the continuation of viable populations. By providing landscape connections between larger areas of habitat, corridors enable migration, colonization, and interbreeding of plants and animals. Corridors can consist of a sequence of stepping stones across the landscape (discontinuous areas of habitat such as wetlands and roadside vegetation), continuous linear strips of vegetation and habitat (such as riparian strips, drainages, ridge lines etc.), or they may be parts of a larger habitat area selected for its known or likely importance to local fauna. Wildlife

corridors may also connect wildlife populations separated by human activities or structures (such as roads, or development).

Concern Statement #357: The management approach in the Livestock Grazing section in the Forest Plan that reminds forest managers to "Consider establishing forage reserves..." should be clarified. Is this management approach referring to pasture rotation or allotment vacancy? It has been proven over time that vacant allotments lose their improvements and no one is willing to spend the money to fix them, especially the fences. Also as the grasses get decadent they are less vigorous. If this is intended to be for a drought reserve, one would think that is a good strategy, when possible. It should be part of an overall collaborative drought plan and the "reserve" could rotate between various pastures within an allotment, so that one could maintain good plant health, younger age structure, soil microbe health, etc. (58-11)

Response: A definition for "forage reserves" has been added to the Glossary for the Forest Plan. The definition explains that forage reserves are "Areas created from former allotments or pastures that are appropriate for temporary or emergency grazing." The intent of the management approach is simply to remind forest managers to consider identifying former allotments and pastures as forage reserves to improve flexibility and balance between restoring fire-adapted ecosystems and range management. Having areas available for temporary grazing provides the Forest with an opportunity to pursue vegetation treatments on an allotment while continuing to make forage available to the allotment grazing permittee. Likewise, forage reserves provide opportunities for emergency grazing when wildfires create conditions in an allotment that prevent livestock grazing.

Law Enforcement

Concern Statement #662: The Forest Service should use its limited funds to police the Forest and enforce existing regulations. (27-7, 56-139)

Response: No change to the plan has been made in response to this comment. Enforcement is not a forest plan component, but is a requirement of the Agency, regardless of the land management plan in effect.

Concern Statement #449: The Forest Plan should require highly visible law enforcement against unauthorized uses. (56-153)

Response: Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect. The level of Forest Service law enforcement is dependent on staffing, which is reflective of the budget allocated to the Forest Service from Congress.

Multiple-use Management

Concern Statement #4: The Forest Service should manage the Forest for multiple use benefits to the public. (2-1, 94-2)

Response: The Forest Plan is designed to contribute to ecological, social, and economic sustainability focused on meeting the needs of the present generation without compromising the ability of future generations to meet their needs. The Forest Plan gives direction to manage the Forest consistent with the Multiple Use-Sustained Yield Act of 1960 and provides goods and services including outdoor recreation, timber, range, watershed, wildlife, and fish.

This revision was conducted under the legal framework of the National Forest Management Act, and the provisions of the 1982 Planning Rule, as allowed by the 2012 Planning Rule language (36 CFR 219.7(b)(3). Management of national forests is jointly based on the principles of conservation and multiple use. Multiple uses are not prioritized and are consistent with desired conditions for plan resource areas and were considered in the effects analyses.

The Multiple Use-Sustained-Yield Act of 1960 (section 1) states that,

> "the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

The National Forest Management Act) (section 6(e)(1)) states that in revising plans,

> "provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple-Use, Sustained-Yield Act of 1960, and in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness…"

Concern Statement #723: The Forest Service should examine the current demand of uses and evaluate how many uses the Forest can accommodate and still fulfill its mission to promote responsible land management and its stewardship responsibilities. (27-8, 56-136)

Response: The Forest Plan is, by design, strategic in nature. It focuses on desired conditions that are described in qualitative and quantitative terms. The Forest Plan sets forth objectives that are measurable, anticipated results that help achieve or move toward desired conditions over the life of the Forest Plan. Determinations on how specific uses can be accommodated and managed are made at the project level, taking site-specific information into account to ensure that the authorized uses maintain or move the Forest toward the desired conditions in the Forest Plan.

Concern Statement #727: The Forest Service should design aspen exclosures to accommodate recreational access. (21-1)

Response: The Forest Plan has been adjusted in response to this comment. A guideline in the Aspen and Maple section has been clarified to remove fences around aspen to prevent excessive herbivory once they are no longer needed. See FW-TerrERU-AspMpl-G-1. Furthermore, a guideline in the All Terrestrial Ecological Response Units section requires management activities (which includes exclosure fencing) to be designed to maintain or move toward desired conditions. See FW-TerrERU-All-G-1. The Dispersed Recreation section in the Forest Plan includes a desired condition for the diverse landscapes of the Coconino NF to offer a variety of settings and challenges for a broad range of recreational opportunities in all seasons. See FW-Rec-Disp-DC-1. How to design an exclosure and whether it should accommodate recreational access to the exclosure area is determined at the project level, based on the objectives of the project and site-specific information.

Concern Statement #774: The Forest Service should analyze of the effects of the alternatives on wildlife-based recreation, associated economic activity, and the Arizona Game and Fish Department's ability to meet trust responsibilities for managing the state's wildlife resources. (75-160)

Response: The effects of the alternatives on wildlife-based recreation are discussed in the environmental impact statement. See the Environmental Consequences for Developed and Dispersed Recreation in the Recreation section in the environmental impact statement for a discussion on the effects of the alternatives on wildlife-based recreation.

The effects of the alternatives on economic activity associated with recreation are discussed in the environmental impact statement. See the Environmental Consequences in the Socioeconomic section in the environmental impact statement for a discussion on the effects of the alternatives on economic activity associated with recreation. The Socioeconomic section provides a breakdown on the types of activities visitors to the Coconino NF participate in and the relative levels of participation. Although the specific economic value of wildlife-based recreation is not singled out, wildlife-based recreation was considered

when the economic value of recreation on the Coconino NF was calculated. To measure the value of economic activity associated with recreation on the Forest, the Coconino NF used employment and labor income.

The environmental impact statement does not attempt to analyze the effects of the alternatives on the Arizona Game and Fish Department's ability to meet trust responsibilities for managing the state's wildlife resources. Those conclusions are more appropriately made by the Arizona Game and Fish Department. The environmental impact statement does, however, disclose how the alternatives could impact access and authorized activities on the Forest. In general, the Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not make decisions that directly affect access or other Arizona Game and Fish Department activities. Those decisions are made at the project level based on site-specific information. For example, specific motorized use determinations would be done through future project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). The Forest Plan provides the framework that would guide project-level considerations.

Plan and EIS

Concern Statement #149: The Forest Plan should include components to strengthen the procedures created by the National Environmental Policy Act. (53-1)

Response: Laws and regulations, or adjustments to them, are not forest plan-level decisions. Regulations and agency policy have already been created regarding implementation of NEPA and already guide the Forest. See 36 CFR Part 220 and FSH 1909.15 National Environmental Policy Act Handbook. Existing law, regulation, and policy are not being duplicated in the Plan.

Concern Statement #164: The Forest Plan should provide consistent direction on similar subject matter that is addressed in different sections. (65-1)

Response: A comprehensive review of the Forest Plan has been conducted to improve the consistency of direction on similar subject matter in different sections. One approach was to combine the repetitive direction into one component. If the component was addressing a resource that could be impacted by a variety of actions, the direction was placed in the section designated for the resources. In the few situations when a component appeared in more than one location in the Forest Plan, the plan components were made consistent.

Concern Statement #722: The Forest Service should clearly state and justify the needs of change in the environmental impact statement and provide reasons for abandoning decisions and components included in the current forest plan. (84-1)

Response: Chapter 1 of the environmental impact statement includes a Needs for Change section. As discussed in the Needs for Change section, in preparation for plan revision, the Coconino NF identified guidance in the current forest plan that is working, new conditions that need to be addressed, and ongoing challenges that could be better addressed. This preparatory work is documented in the "Analysis of the Management Situation," which was completed in May 2010 (USDA Forest Service 2010a).

The Analysis of the Management Situation highlights the social, economic, and ecological conditions and trends in and around the Coconino NF, as detailed in the Forest's Economic and Social Sustainability Assessment (USDA Forest Service 2008a), the Ecological Sustainability Report (USDA Forest Service 2009a), as well as the Recreation, Grazing, Minerals, and Timber Demand report (USDA Forest Service 2010b) for the Forest. This report uses these key findings, along with public input, to identify areas in the current forest plan direction that do not provide adequate guidance for the present and the future, and

attempts to consider potential implications of those forest plan needs for change to other resources. Based on a review of the Analysis of the Management Situation, the Forest leadership team identified three priority themes to focus the scope of this plan revision effort: Recreation, Community-Forest Interaction, and Maintenance and Improvement of Ecosystem Health.

Rather than restate the details from the preparatory work the Forest has conducted on the needs for changes, the Needs for Change section incorporates the Analysis of the Management Situation by reference and discusses the three priority themes that are the focus of this plan revision effort.

Where appropriate, direction from the 1987 plan was retained, reworded, or reframed in the form of desired conditions, objectives, standards, or guidelines. However, for a variety of reasons, many decisions and plan components included in the 1987 plan were not carried forward into the revised Forest Plan. One of the goals for the revised Forest Plan is to avoid repeating law, regulation, or policy. Accordingly, direction from the 1987 forest plan that repeated law, regulation, or policy, including recovery plans for threatened and endangered species, was not retained in the revised Forest Plan. Avoiding duplication of these authorities reduces the need for plan amendments if those authorities are changed. Direction that identified site-specific projects to be completed was not retained because the Forest Plan does not make site-specific decisions; those decisions are made at the project level based on site-specific information. Direction related to projects that have already been completed was not retained. Direction that was outdated, too administrative, or redundant of forestwide direction are other examples of direction that was not carried forward. Appendix I in the Final Environmental Impact Statement includes a crosswalk that illustrates how direction from the 1987 plan was incorporated into the revised plan and, when appropriate, explains why direction was not retained. While the crosswalk is not an exhaustive account of all plan direction, it does highlight those issues that drove the plan revision process (e.g., needs for change) and that were critical to appendix D - Response to Comments.

Concern Statement #163: In the revised plan under Plan Content, the Forest Service should frame the intent to accomplish desired conditions with more realistic terminology. For example, plan language talks about 'management actions to accomplish desired conditions' implying a certainty about accomplishments that in reality are influenced by a variety of factors and may not be possible. More realistic terminology could be "maintain or make progress towards achieving" or "designed to accomplish" or "intended to accomplish." This also occurs in the sections on Guiding Future Projects, and Program Plans and Assessments. (58-4)

Response: The discussion on management approaches in chapter 1 of the revised Plan has been adjusted as suggested to address your concern.

Concern Statement #152: The Forest Service should include an appendix to the Forest Plan that lists lawsuits filed against the agency and summarize the obligations that these lawsuits have created on the Forest. (56-70)

Response: An appendix of lawsuits filed against the Forest has not been added to the Forest Plan. The Forest Plan has been designed to not repeat existing obligations, such as law, regulation, or policy. The same is true of past litigation.

Concern Statement #162: The Forest Service should adjust the definition of a desired condition that is included in chapter 1 of the revised Plan. (58-2)

Response: Although the revised Plan retains the sentence that states that projects and site-specific activities "must be consistent with desired conditions...," the following additional information has been added to this discussion on desired conditions to clarify the ways site-specific projects can demonstrate consistency with desired conditions:

To be consistent with the desired conditions of the plan, a project or activity, when assessed at the appropriate spatial scale described in the plan (e.g., landscape scale), must be designed to meet one or more of the following conditions:

- Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
- Be neutral with regard to progress toward plan desired conditions; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.

Concern Statement #148: The Forest Service should define "objectives" in a manner that is consistent with the National Forest Management Act implementing regulations. (84-17)

Response: The description of "objectives" in chapter 1 of the Forest Plan has been adjusted to improve the understanding of this type of plan component. The description is consistent with the definition of an "objective" found in the National Forest Management Act implementing regulations.

The description in chapter 1 of the Forest Plan explains that objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded, should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

Concern Statement #41: The Forest Service should review all objectives in the Plan to ensure that they are specific, measurable, attainable/achievable, relevant, and timely. (64-31, 86-3)

Response: The objectives in the Forest Plan have been reviewed and retained with some minor editorial adjustments. Objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded, should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

Concern Statement #1: The Forest Plan should retain existing standards from the 1987 forest plan and include stronger binding standards and guidelines instead of relying on discretionary desired conditions. (5-1, 74-2, 74-3, 74-4, 74-6, 74-8, 81-2, 81-5, 84-18, 84-36)

Response: Many of the 1987 forest plan standards and guidelines not carried forward into the Forest Plan duplicated law, regulation, or policy; the intent was not to repeat law, regulation, or policy. Where appropriate, 1987 forest plan standards and guidelines were retained, reworded, or reframed in the form of desired conditions, objectives, standards, or guidelines.

Desired conditions are not just aspirations. While the Foundations of Forest Planning suggests that desired conditions should be able to be accomplished in 10 to 50 years, this is not a requirement under the 1982 Planning Rule. In fact, the Foundations of Forest Planning document acknowledges that longer timeframes may be used. USDA Forest Service, Foundations of Forest Planning, Volume 1 (Version 3.1) at 10 (USDA Forest Service 2008b). Depending on the resource, its current condition, and other Forest priorities, some desired conditions may only be achievable over a long timeframe (e.g., several hundred years). To be consistent with the Forest Plan, projects and activities must be designed to maintain, move toward, or be neutral to desired conditions as described in chapter 1 of the Forest Plan. The following information has been added to the discussion on desired conditions in the Plan Content section to clarify the ways site-specific projects can demonstrate consistency with desired conditions:

To be consistent with the desired conditions of the plan, a project or activity, when assessed at the appropriate spatial scale described in the plan (e.g., landscape scale), must be designed to meet one or more of the following conditions:

- Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
- Be neutral with regard to progress toward plan desired conditions; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.

Objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

Chapter 1 of the Plan also explains that standards and guidelines are not discretionary. Standards are constraints upon project and activity decision making. A project or activity must be consistent with all standards applicable to the type of project or activity and its location in the plan area. A project or activity is consistent with a standard in only one way; it is designed in exact accord with the standard. Variance from a standard is not allowed except by plan amendment. A project or activity must be consistent with all guidelines applicable to the type of project or activity and its location in the plan area. A project or activity is consistent with a guideline in either of two ways: (1) it is designed exactly in accord with the guideline; or (2) it varies from the exact words of the guideline, but it is as effective in meeting the intent of the guideline to contribute to the maintenance or attainment of the relevant desired conditions and objectives. Guidelines must be followed, but they may be modified for a specific project if the intent of the guideline is followed and the deviation is addressed in a decision document with supporting rationale. However, when deviation from a guideline does not meet the original intent, a plan amendment is required.

Finally, in response to these concerns, the Forest Service has prepared a crosswalk between the Coconino 1987 forest plan (as amended) and the revised Forest Plan, which has been appended to the Final Environmental Impact Statement. This appendix, while not an exhaustive account of all plan direction,

tracks plan elements relevant to issues that drove the plan revision process, and/or were highlighted in appendix D (Response to Comments).

The effects of removing or modifying standards put forth in the 1987 forest plan are analyzed in chapter 3 of the environmental impact statement, which discloses the effects of alternative A (the 1987 forest plan) compared to alternatives B (modified), C, and D.

Concern Statement #681: The Forest Service's less prescriptive plan components in the action alternatives facilitate the practice of adaptive management. Proper Adaptive Management requires specific goals, standards, guidelines, quantifiable metrics, and triggers for change. If the Forest Service truly wishes to practice Adaptive Management techniques, it should create a strong monitoring and adaptive management plan with strict standards for accountability. (56-55)

Response: As the comment correctly recognizes, the Forest Plan uses a more strategic approach that generally avoids applying overly prescriptive direction. This approach allows the Forest Plan to guide decisions on activities and projects in a manner that ensures the Forest moves toward or maintains desired conditions without dismissing or unnecessarily constraining an activity or project without considering it at the project level where site-specific information can inform the decision. Adaptive management strategies, including metrics and triggers for change, would be identified at the project level based on the type of project and its purpose and need.

Concern Statement #171: The Related Plan Content sections in the Forest Plan should include more comprehensive lists of related content. (74-83, 80-14)

Response: The "Related Plan Content" sections have been removed from the Forest Plan to remove the appearance that they put forth a complete listing of other related plan content. As with the 1987 forest plan, it is necessary to read all of the plan components when implementing the Forest Plan. In general, components are grouped together by resource or program area. For example, most direction on the management of soil will be found in the Soil section and not repeated in other sections. However, there are instances where placing in another section makes the most sense. For example, plan components that affect certain types of bat habitat may be in the Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) section, instead of in the Wildlife, Fish, and Plants section, because the plan components only come into play if particular geological resources are present. See FW-BioPhys-Geo-3.

Concern Statement #155: The Forest Plan should require personnel reductions commensurate with reductions in responsibilities. (108-2)

Response: Staffing levels are outside the scope of the Forest Plan.

Concern Statement #153: The Forest Plan and the Draft Environmental Impact Statement should be revised based on public comments and released for additional public comment. (74-1, 81-10)

Response: The Coconino NF followed the public participation requirements outlined in the National Environmental Policy Act, National Forest Management Act, and provisions of the 1982 Planning Rule to develop the proposed plan, alternatives, and a Draft Environmental Impact Statement. These documents were made available for review during a 90-day public comment period. The public comments received on the proposed plan, the alternatives, and the Draft Environmental Impact Statement have been used to make adjustments to the proposed revised plan, the alternatives, and the environmental impact statement. The adjustments were not substantial enough to merit publication of a supplemental or revised environmental impact statement or conduct another comment period.

<u>Concern Statement #147:</u> The Forest Service should collaborate with stakeholders during the implementation phase of the Forest Plan to ensure that there is adequate and consistent public education on, community understanding of, and compliance with the direction in the Forest Plan. (59-2, 70-6)

<u>Response:</u> The general direction associated with education has been grouped into the Interpretation and Education section. Desired conditions in this section seek to have well-informed visitors through a variety of strategically located interpretive facilities and/or efforts. See FW-InterpEd-DC-1 and 2. These efforts would include information boards providing recreation maps and visitor information, which may include site-specific interpretation, trip preparedness, ethics, seasonal information, and restrictions or closure. See FW-InterpEd-DC-3. These communication efforts would be designed to show respect for the diverse backgrounds and needs of visitors. See FW-InterEd-DC-1.

Providing forest visitors with properly placed, clearly worded signs and information on authorized motorized use and restrictions is also a goal of the Forest Plan. See FW-InterpEd-DC-5. A guideline in this section directs designated trail uses (e.g., motorized, mechanized, equestrian, etc.) to be identified at trailheads to reduce user conflicts, and impacts to trails and associated resources. See FW-InterpEd-G-3. Finally, a management approach is included in the Interpretation and Education section to remind forest managers to:

> Work with agencies, motorized recreation user groups, and other stakeholders to establish interpretive messages and programs for designated motorized routes and areas. These efforts may include improved signs, information kiosks, and other interpretive tools. Interpretive themes may include messages to foster conservation ethics, to prevent lost riders, to show opportunities of where to ride, to identify dangerous and/or closed areas, to teach riding ethics, and to reduce user conflicts.
>
> Collaborate with volunteers, other agencies, and stakeholders to promote interpretive efforts both on and off the Forest.

Several All Recreation management approaches also address the need to work together to educate forest visitors on forest management. These management approaches remind forest managers to:

> Collaborate with State and Federal agencies including National Park Service, Arizona State Parks, AZGFD, concessionaires, chambers of commerce, nonprofit organizations, Northern Arizona University, state, city and county governments, recreation stakeholders, local communities and citizens, partners and volunteers regarding provision of recreation opportunities in Northern Arizona and communicating these to the public. Work in partnership to find creative solutions to operate and maintain recreation sites, trails and trailheads, and provide interpretive and environmental education. Determine gaps and overlaps in opportunities and resolve conflicts between users, and providers. Work together to determine activities that increase our capacity to serve a diverse population while promoting social, economic and natural resource sustainability.
>
> Coordinate with the AZGFD and other stakeholders to provide a network of wildlife viewing opportunities.
>
> Coordinate with the Arizona Game and Fish Department to provide fishing access to meet goals and objectives of the Department's fisheries plans.
>
> Collaborate with the AZGFD, local law enforcement, and other stakeholders to address issues and opportunities related to recreational shooting on the Coconino NF.

Concern Statement #158: The Forest Plan should be formatted for easier use. The environmental impact statement should include a more thorough summary of the alternatives to the proposed actions, a more thorough comparison of the alternatives, and specific descriptions of changes from existing policies. (49-1, 59-1, 75-27, 94-1)

Response: Several changes have been made to the Forest Plan to make it easier to understand and use. The descriptions of the various plan components in chapter 1 of the Forest Plan have been edited to make these concepts easier to understand. Plan components were adjusted to remove subjectivity and ensure consistent interpretation and application by a variety of users. Plan components in particular resources were integrated and organized in their appropriate sections. For example, plan components related to soils were gathered from other sections of the Forest Plan and organized in the Soils section. In chapter 3 of the Forest Plan, management areas were adjusted to remove overlapping guidance.

Additional editorial effort has been placed to the environmental impact statement as well. For example, the environmental impact statement has been updated and re-organized to mirror the organization of the Forest Plan. The tables at the end of chapter 2 in the environmental impact statement (comparing the alternatives and summarizing the effects of the alternatives) have been reviewed and edited to make comparing the alternatives easier. The proposed changes in management from the 1987 plan are summarized in the Addressing Needs for Change and Concerns Raised in Scoping section for alternative B in chapter 2 of the Final Environmental Impact Statement. This section discusses how through internal review and public comment, some direction from the 1987 plan was found to be in need of change. To further aid in tracking the changes from the 1987 plan to the revised Forest Plan, an appendix has been added to the environmental impact statement that illustrates how direction from the 1987 plan was incorporated into the revised plan and, when appropriate, explains why direction was not retained. See appendix I in the Final Environmental Impact Statement.

Concern Statement #542: The Forest Plan should include additional objectives, standards, and guidelines to help meet the desired conditions. (74-5, 74-7, 85-1)

Response: Desired conditions in the Forest Plan do not need an accompanying standard or guideline to be implemented. While it is true that projects and activities must meet the guidance in standards and guideline, projects and activities must also be consistent with the desired conditions in the Forest Plan. To demonstrate consistency with the desired conditions, a project or activity must be designed to

- Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
- Be neutral with regard to progress toward plan desired conditions; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.

See the Plan Content and Future Projects, Program Plans, and Assessments sections in chapter 1 of the Forest Plan for additional information on the need to be consistent with desired conditions.

Objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and

staffing and can be exceeded should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

Standards and guidelines provide the sideboards or constraints for designing projects and activities that are necessary to ensure that those projects and activities help maintain or move toward desired conditions. The Forest Plan includes standards and guidelines that sufficiently provide these sideboards and constraints. To reduce redundancy in the plan, every standard and guideline is not necessarily repeated under every resource or uses section where those standards and guidelines contribute to desired conditions or objectives. Standards and guidelines under one section (i.e., the livestock grazing standard (FW-Graz-S-1) requiring troughs and uncovered storage tanks to incorporate animal escape devices) may contribute to desired conditions of a resource located in another section of the plan (i.e., Wildlife, Fish, and Plants).

Concern Statement #631: The Forest Plan should include a drought policy. (64-24)

Response: No change has been made to the Forest Plan in response to this comment. The Forest already has a drought policy in the Region 3 Supplement to Forest Service Handbook 2209.13, 19. The drought guidelines found in that section are agency policy that applies to the Coconino NF. A reference to this policy has been added to the Forest Plan in the Livestock Grazing section in appendix D, Other Sources of Information.

Concern Statement #632: The Forest Plan should include illustrations depicting the age classes for pinyon juniper, similar to those provided for ponderosa pine. (44-2)

Response: No change has been made to the Forest Plan in response to this comment. No similar illustrations for the age classes of pinyon juniper is available at this time.

Concern Statement #645: The Forest Plan should include the standards and guidelines required by the National Forest Management Act. (84-108)

Response: The Forest Plan was prepared in compliance with the provisions of the 1982 Planning Rule and Southwestern Region planning direction (USDA Forest Service 2009b). The 1982 Planning Rule includes the regulations developed to implement the National Forest Management Act.

In accordance with NFMA, standards and guidelines are distributed in numerous locations in the plan. Additionally, chapter 4 of the plan contains suitability analyses for timber, grazing, and recreation and transportation. Chapter 5 contains the Monitoring Strategy and Monitoring Plan. Appendix B in the Final Environmental Impact Statement describes Public Collaboration and Involvement.

Concern Statement #752: The Forest Service should consider the latest Arizona Department of Transportation 5-Year Plan and Tentative 5-Year Plan in the cumulative effects analysis. (83-3)

Response: The Final Environmental Impact Statement and the Infrastructure Specialist Report have been updated to incorporate the latest Arizona Department of Transportation 5-Year Plan and Tentative 5-Year Plan.

Plan Revision Process

Concern Statement #679: The Forest Service should take steps to improve sub-standard management practices. (1601-1)

Response: Thank you for your comment. Through the Analysis of the Management Situation, the Coconino NF identified current ecological and socioeconomic conditions and trends taking place on the Forest and the associated “needs for change” to be addressed in the revised plan. The needs for change are

grouped under three broad revision topics: (1) recreation, (2) Forest community interaction, and (3) maintenance and improvement of ecosystem health (USDA Forest Service 2010). The proposed revised plan and the alternatives were developed to address management on these topics.

Concern Statement #429: The Forest Service should integrate the Four Forest Restoration Initiative (4FRI) and travel management process into the forest plan revision effort and proactively communicate with affected agencies and stakeholders how these endeavors interact with each other. (48-1, 64-4, 75-33, 75-105, 75-106, 75-107, 79-1, 1787-3)

Response: 4FRI and the Coconino NF travel management process have not been combined into the forest plan revision effort. Forest plan revision, 4FRI, and travel management are separate processes that are conducted at separate scales. Forest plan revision develops a management framework at a programmatic scale. The Forest Plan provides management direction for resources and activities on the Forest, including guidance for future restoration activities like 4FRI and changes to the transportation system considered according to the Travel Management Rule. While these three efforts have not been combined into one all-encompassing endeavor, there has been ongoing coordination between these efforts to ensure consistency between them and to facilitate implementation of any future project level decisions under the revised Forest Plan. For additional information on the ongoing coordination between the forest plan revision effort and 4FRI, please see the response to Concern Statement #161.

The Forest Plan provides plan components on forest resources that will provide a framework for the projects being proposed under 4FRI. For examples, see the desired conditions, objectives, and guidelines included in the Ponderosa Pine and Mixed Conifer Ecological Response Units that will guide the projects designed under the Four Forest Restoration Initiative. The specific restoration activities are developed and evaluated in separate analysis through project-level decision making, such as the 4FRI Record of Decision that covers restoration activities on portions of the Coconino and Kaibab NFs or the Rim Country project, which covers portions of the Coconino, Apache-Sitgreaves, and Tonto NFs. These decisions must also be consistent with the National Environmental Policy Act (NEPA) and the Forest Service Handbook and Forest Service Manual. These decisions would include analysis and opportunity for public involvement.

Changes to the Coconino NF's transportation system are evaluated in separate analysis through project-level decision making, such as the implementation of the Travel Management Rule (36 CFR§212). These decisions would be consistent with the National Environmental Policy Act (NEPA) and the Forest Service Handbook and Forest Service Manual. These decisions would include analysis and opportunity for public involvement. Site-specific travel management planning will use the framework set by the plan (such as desired conditions, standards, and guidelines) and will consider potential resource impacts, access needs, public input, and alternative views. If undesirable resource conditions resulted from open roads, they could be addressed through site-specific evaluation and analysis. While the Forest Plan does not duplicate the Travel Management Rule or the directives related to it, it is consistent with both and is meant to be used along with the directives and the motor vehicle use map. See FW-RdsFac-DC-5, FW-RdsFac-O-1, FW-RdsFac-S-1, and FW-Rec-Disp-S-1.

Concern Statement #730: The Forest Service should not use reports prepared by the Forest Service because it creates questions about the objectivity and credibility of the analysis. (55-1, 1787-5)

Response: The Forest Service creates specialist reports to assist in the preparation of environmental analyses required by the National Environmental Policy Act. These specialist reports apply the best available science to the best available data to determine the potential effects of a proposed action and alternatives to that proposal. The information from these reports is then summarized in the environmental analysis that is prepared as required by the National Environmental Policy Act. These specialist reports do not involve basic research and are not making new scientific findings that would normally be subjected to

rigorous review to determine if the findings are accurate. These specialist reports are, however, based on best available science that has been peer reviewed and on field observations from professional experience. It is not inappropriate to use these reports to prepare the environmental impact statement for this forest plan revision effort.

Concern Statement #683: The Forest Service should take steps to have better public involvement. (1787-4)

Response: Thank you for your comment. The Forest has endeavored throughout this forest plan revision effort to encourage public involvement in the process. Appendix B in the Draft Environmental Impact Statement provides a fairly extensive list of the Forest's public involvement and collaboration efforts between April 2006 and September 2013. Since the Draft Environmental Impact Statement was distributed for public comment in December 2013, the Forest has held seven public meetings and participated in numerous other meetings with various stakeholders. To provide notice of the public meetings, the Forest directly contacted thousands of interested parties via mail and email. Notices were also sent to media outlets, posted on the Forest's website, and shared via twitter.

To provide easier access to documents associated with the forest plan revision effort, a wide array for information has been provided on the project's website. The Forest even created an interactive mapping tool to facilitate comparison of the alternatives and provide reviewers a tool that allowed them to view the maps at a scale of their choosing.

While these efforts were more than adequate to meet the Forest's legal requirements regarding public involvement, the Forest will continue to look for ways to strengthen its public involvement efforts.

Concern Statement #621: The Forest Plan should provide a detailed explanation of the public notification procedures that will be applied to when changes to the Forest Plan are considered. (74-68, 74-69)

Response: The Forest Plan has been adjusted in response to this comment. Citations to the applicable regulations have been added to the Futures Changes to the Plan section. The details on the public notification that is required for a change to the Forest Plan can be found in these regulations. Also, a sentence has been added to the Plan Content section in chapter 1 of the Forest Plan indicating that additional information on public notification of changes to the Forest Plan can be found in the Futures Changes to the Plan section in chapter 1.

Concern Statement #763: The Forest Service should analyze how the proposed revised plan's standards and guidelines are different from those found in the 1987 Coconino NF Forest Plan and how those differences may affect forest resources (e.g., old-growth forest, species diversity, Endangered Species Act requirements). (84-75)

Response: The environmental impact statement analyzes the effects of the plan decisions collectively, not each individual plan decision. Alternative A represents the 1987 plan including its standards and guidelines and is analyzed in the environmental impact statement along with alternatives B (modified), C, and D. Therefore, the effects of changing the 1987 plan (alternative A) to one of the action alternatives (alternatives B (modified), C, D) have been analyzed in the environmental impact statement. The effects to forest resources from the four alternatives are presented throughout chapter 3 of the environmental impact statement in the “Environmental Consequences” sections.

Concern Statement #670: The Forest Service is obligated to consult with USFWS to ensure the plan revision “is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species.” (84-104)

Response: The Forest Service analyzed the anticipated effects to listed species and their habitat (including critical habitat) of applying the entirety of management direction and guidance in the proposed plan (alternative B (modified)) to future projects. This analysis was contained within a biological assessment (BA), which served as the basis for consultation with the U.S. Fish and Wildlife Service (USFWS) regarding federally listed species under § 7(a)(2) of the Endangered Species Act, as amended. Information from the BA was used to update the environmental impact statement between draft and final and included effects determinations, and updates to listing status and threats to species and their habitats. The USFWS analysis of whether or not the proposed plan was likely to jeopardize the continued existence of the species or adversely modify designated critical habitat was contained in a biological opinion (BO) (USFWS 2017). The conclusions from the BO are summarized in the record of decision.

Travel Management

Concern Statement #675: The 2011 Travel Management decision is overly restrictive and should be revisited and the Forest's budget should be reduced commensurate with unreasonable road closures. (108-3, 1787-6)

Response: These comments are outside the scope of the plan. The Forest Plan is programmatic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not direct or designate routes or areas for motorized travel. Specific access and motorized use determinations would be done through future project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Furthermore, the budgets for forest management are allocated by Congress, not the Forest.

Resource-specific Topics

Air

Concern Statement #144: The Forest Plan should include more plan components to fully safeguard air quality. (56-76, 56-78, 95-4)

Response: No change has been made in response to this comment. Air quality is regulated by the Arizona Department of Environmental Quality (ADEQ) and the Environmental Protection Agency. The Forest Plan includes components that tier to and require the Forest to meet all State and Federal air quality regulations and legal requirements. See FW-Air-DC-1 and FW-Air-G-1. The Air Quality section in the Forest Plan also includes several management approaches regarding coordination with ADEQ regarding impacts to air quality from prescribed burns and wildfires. They remind forest managers to:

> Coordinate with ADEQ during prescribed burns to comply with State and Federal regulatory requirements for emissions and impacts to Class I areas.
>
> Coordinate with ADEQ during wildfires to ensure ADEQ is aware of potential smoke impacts to receptors.

In addition, smoke-sensitive areas should be identified and management objectives and courses of action should be developed to mitigate impacts to those areas. Smoke-sensitive areas are areas in which smoke from outside sources is intolerable for reasons such as heavy population, existing air pollution, or intensive recreation or tourist use. See FW-Air-G-2. An additional management approach was added to consider design features, best management practices, or mitigation measures to reduce fugitive dust where needed.

Concern Statement #159: The Forest Plan should manage the impacts of fugitive dust on air quality. (56-77)

Response: As your comment suggests, the Forest recognizes fugitive dust as a source of PM_{10}, which is subject to State and Federal air quality standards. The revised Plan has a desired condition for the air quality on the Forest to meet State and Federal air quality standards. See FW-Air-DC-1. Specific actions relating to fugitive dust will be identified at the project level based on the activity being considered and the potential for fugitive dust. As a reminder to consider fugitive dust during project development, a management approach has been added to the Air Quality section, which states:

> Project activities should implement design features, best management practices (BMPs), or mitigation measures to reduce fugitive dust where needed.

In addition, a soil guideline would require project-specific design features be used on particularly vulnerable soils to avoid or minimize soil impacts. These soils include those on steep slopes, those with moderate or severe erosion hazard, and those that are sensitive to degradation when disturbed. See FW-Soil-G-3. Desired conditions for soil promote soil with the ability to resist erosion and the maintenance of vegetative ground cover at levels that contribute to soil stability and prevent erosion for exceeding natural rates of soil formation within their inherent capability. See FW-Soil-DC-1 and 2. Application of these plan components will reduce the potential for disturbance of soil to produce fugitive dust.

Concern Statement #196: The revised Plan should contain plan components that address the night sky resource. (74-43, 74-44, 74-45, 4-46, 74-47, 74-48, 74-49, 74-50)

Response: Several adjustments have been made to the revised Plan in response to your comment. Additional information on the night sky resource and observatories has been added to the General Description and Background subsection of the Air Quality, Wildland-urban Interface, Anderson Mesa, Flagstaff Neighborwoods, and Long Valley Management Areas sections. A desired condition for clear and dark night skies was added to the Air Quality section. See FW-Air-DC-2. A desired condition to protect astronomical sites is included in the Wildland-urban Interface section. See FW-WUI-DC-2. These are forestwide desired conditions that apply to all management and special areas. Furthermore, local ordinances related to light control or light pollution have been added to the Air section in appendix D of the revised Plan.

Concern Statement #708: The Forest Service should provide information to support that suggestion that drip torches and aerial support are emission reduction techniques associated with air quality. (22-1)

Response: The information in the environmental impact statement has been adjusted in response to this comment. A citation to the following document has been added to the environmental impact statement.

> U.S. Department of Agriculture (USDA), Forest Service. 2002. Wildland Fire in Ecosystems: Effects of Fire on Air. General Technical Report RMRS-GTR-42 Vol. 5. December 2002.

The analysis in the Air Quality section has been clarified to recognize that burning when atmospheric conditions are optimal, or limiting these operations when ventilation is poor are emission reduction techniques. Drip torches and aerial support are tools to implement these techniques and have been deleted from this discussion in the environmental impact statement to remove the implication that they are the actual emission reduction techniques.

Concern Statement #717: The Forest Service should discuss how air emissions from pile burning of residual fuels could be reduced by using the fuels for biomass energy production. (95-5)

Response: A discussion on utilization, which is any activity that removes biomass prior to fuel treatment, has been added to the Air Quality section in the environmental impact statement.

Biophysical Features

Concern Statement #174: The Forest Plan should expand the Caves, Cliffs, and Talus Slopes section to include a discussion on karst and pseudokarst. (80-1, 80-2)

Response: In response to this comment, two paragraphs discussing karst and pseudokarst have been added to the General Description and Background section for Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) section of the Forest Plan. Definitions for "karst" and "pseudokarst" have also been added to the Glossary for the Forest Plan.

Concern Statement #175: The Forest Plan, page 248, refers to the Coconino National Forest Cave Resource Management Guide as a referenced document. Please title the document Coconino National Forest Cave and Karst Management Guide. (80-4)

Response: The name of the referenced document has been edited as suggested. Because the management guide is still a draft, it has been labeled as such.

Concern Statement #176: The Forest Service should change the name of the "Caves, Cliffs, and Talus Slopes" section to include the terms "karst" and "pseudokarst." (80-5, 80-60)

Response: The name of one of the Biophysical Features subsections in the Forest Plan has been adjusted in response to this comment. The subsection is now called "Geological Features." The terms "karst" and "pseudokarst" are discussed in General Description and Background of the Geological Features section. The old name of this section has been replaced with the new name throughout the Forest Plan.

Concern Statement #193: The desired condition in the Caves, Cliffs, and Talus Slopes section of the Forest Plan that addresses various features of a cave (see Draft Revised Plan, FW-BioPhys-Geo-DC-4) should be adjusted to list "hydrological" as one of those features. It is not good to prevent non-turbid water from flowing underground, but it is good to prevent siltation. (80-10)

Response: The desired condition has been adjusted to incorporate your suggestion. See FW-BioPhys-Geo-DC-1. In addition, siltation is addressed in FW-BioPhys-Geo-G-2 and 8.

Concern Statement #194: The Forest Plan should incorporate the following management approach in the Caves, Cliffs, and Talus Slopes section: Caves, karst, and pseudokarst are managed consistent with the Coconino National Forest Cave and Karst Management Guide. (80-12)

Response: A management approach has been added to the Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) section in response to your comment. The management approach states:

> Utilize current cave management plans and guides.

No specific cave management plan or guide was identified because those documents can change over time. This management approach provides a reminder to forest managers to seek out and consider plans and guides that are in effect at the time. The Coconino National Forest Cave and Karst Management Guide is mentioned by name in appendix D of the revised Plan.

Concern Statement #287: The Forest Plan should recognize the value of slickrock sandstone areas the Sedona-Oak Creek area to cross-country mountain bike travel. (67-13)

Response: No changes to the Forest Plan were made in response to this comment about the value of cross-country mountain biking on slickrock in the Sedona-Oak Creek area. The Forest Plan acknowledges

that three of the management areas in the Sedona-Oak Creek area provide opportunities for mountain biking. All of these management areas include desired conditions for a network of primarily non-motorized trails that provide opportunities at multiple development levels for a variety of recreationists, including mountain bikers. See MA-RedRock-DC-3, MA-HouseMtn-DC-2, and MA-SedN-DC-2.

Concern Statement #342: The Forest Plan guideline to mitigate human alteration of caves (see Draft Revised Plan FW-BioPhys-G-4) should ensure that closure areas around caves or gating for caves are only considered when they are the best options to protect cave and wildlife resources and public safety. (85-21)

Response: The guideline addressing closure areas around caves or gating of caves has been merged into another guideline in Geological Features (formerly Caves, Karst, Cliffs, and Talus Slopes) section of the Forest Plan that addresses the concern in a strategic manner. Rather than focusing on when a closure area or gating may be appropriate, the guideline directs projects to be designed and uses to be managed to maintain the integrity and function of caves, karst, cliffs, and talus slopes. See FW-BioPhys-Geo-G-1. This allows concerns about the need to control access to an area to protect the cave or associate wildlife resources or to provide for public safety to be balanced against the potential impacts of those controls based on site-specific information.

Concern Statement #343: The Forest Plan should recognize that talus slopes provide habitat for small mammals. (85-17)

Response: Additional information regarding talus slopes has been added to the General Description and Background for the Geological Features section, including a reference to small mammals. The desired condition has been adjusted to be more inclusive and now refers to lichens, plants, invertebrates, and vertebrates. See FW-BioPhys-Geo-DC-7.

Concern Statement #344: The Forest Plan should define the term "significant cave." (75-54, 86-22)

Response: The General Description and Background for the Geological Features section has been edited to respond to this comment. The term "significant cave" is now hyperlinked to the definition in the Glossary.

Concern Statement #345: The Forest Plan should acknowledge some of the elements that make a cave suitable for bats. (85-15)

Response: The General Description and Background for the Geological Features section has been adjusted. The suggested sentence has been added to this section. This section now expressly acknowledges that a cave's suitability for bat roost and hibernacula is determined primarily by cave microclimate; particularly temperature and humidity, as well as protection from disturbance.

Concern Statement #291: The Forest Plan should acknowledge that caves are important as hibernacula for bats. (75-51)

Response: The General Description and Background for the Geological Features section has been adjusted to address this comment. This section now expressly acknowledges that caves can provide hibernacula for bats.

Concern Statement #374: The Forest Plan should refer to the Coconino National Forest Cave and Karst Management Guide. (80-7)

Response: A management approach has been added to the Geological Features section in response to this comment. It reminds forest managers to:

> Utilize current cave and karst management plans and guides.

The Coconino National Forest Cave and Karst Management Guide is not specifically referenced because it is still in draft form. When it is finalized, this management approach will remind forest managers of this resource.

Concern Statement #375: The Forest Plan should manage karst as a separate land use designation. (80-3)

Response: No change has been made in response to this comment for several reasons. First, the Forest Plan does not use "land use designations" for any other resources. Rather, it is organized to provide forestwide direction on resources wherever they occur. The Forest Plan also contains plan decisions and other content that is only applicable to specific areas, in addition to forestwide direction. Including karst as a land use designation would be the equivalent of creating area specific direction for karst. The problem with this approach is that any karst that is not within the karst land use designation area would not be covered by the plan components for that area. To provide protection of and proper management for karst wherever it occurs on the Forest, the Forest Plan includes forestwide direction for karst in the Geological Features section. See FW-BioPhys-Geo-DC 1, 2, 3 and FW-BioPhys-Geo-G-1 and 8.

Concern Statement #376: The Forest Plan should recognize abandoned mines as special habitat for bats in the Caves, Karst, Cliffs, and Talus Slopes section. (75-50)

Response: No change has been made in response to this comment. The Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) section addresses management of a variety of features on the Forest. A review of the mining records on the Forest indicates that there are no underground mines on the Forest. However, if any should occur in the future, abandoned mines should be managed to prevent disturbance to species and spread of disease. See FW-BioPhys-Geo-G-6.

Concern Statement #377: The Forest Plan should include a discussion of the important habitat values associated with cliffs and talus slopes. (75-52)

Response: The General Description and Background for the Geological Resources section has been adjusted in response to this comment. Additional information has been added regarding the habitat values for cliffs and talus slopes, including acknowledgement of nesting habitat for raptors and hibernacula for reptiles.

Concern Statement #378: The Forest Plan should recognize that caves provide bats with specialized conditions for raising young and resting, among other things. (85-16)

Response: The desired condition in the Geological Features section has been adjusted in response to this comment. Specifically, "raising young" was added to the specialized conditions listed in the desired condition. "Roosting" was not replaced with "resting" as suggested, because it is generally included within the definition of roosting. See FW-BioPhys-Geo-DC-3.

Concern Statement #379: The Forest Plan should include direction to prevent the introduction and spread of white-nose syndrome. (75-55, 85-22)

Response: Several adjustments have been made to the Forest Plan in response to comments regarding white-nose syndrome. A guideline that addresses the spread of diseases such as white-nose syndrome has been added to the Geological Features section. See FW-BioPhys-Geo-G-6. See also FW-WFP-G-3 which would manage activities and projects to prevent or reduce the likelihood of introduction or spread of

disease. In addition, a management approach in the Geological Features section has been adjusted. It now contains a specific reference to white-nose syndrome and reminds forest managers to:

> Foster collaboration with the U.S. Fish and Wildlife Service, Bat Conservation International, Arizona Game and Fish Department, the National Speleological Society, and other stakeholders to address conservation, interpretation, and education management for cave dependent species and associated resources. For example, this collaboration could assist with understanding the cause and transmission of white-nose syndrome (which is not currently well understood) or with the development and implementation of cave and karst management plans.

White-nose syndrome is also covered under desired conditions in the section on Invasive Species. These desired conditions promote invasive species being detected at an early stage and being absent or existing at levels that do not disrupt ecosystems or do not affect the sustainability of native species. See FW-Invas-DC-1 and 2. An Invasive Species guideline assures that measures would be incorporated into activities, planning, and implementation to address invasive species and the integrity of native species populations. See FW-Invas-G-1.

Concern Statement #380: The Forest Plan should include a protective buffer of 300 feet on activities that can alter the cave's resources, functions and associated features. (80-9)

Response: The Geological Features guideline has been adjusted in response to this comment. The buffer zone that should be applied to protect cave resources was changed from 200 feet to 300 feet and siltation is specifically mentioned. The guideline also specifically notes that site-specific adjustments can be made based on topography, drainage, soil type, and the expected impact of the proposed activity. See FW-BioPhys-G-2.

Concern Statement #381: The Forest Plan should also list caving in the desired condition that addresses recreational activities that rely upon geological features. See Draft Revised Plan FW-BioPhys-Geo-DC-7. (80-11)

Response: This desired condition has been adjusted in response to this comment. Because geological features could be used in a wide variety of ways for recreation, lists of specific recreational activities associated with geological features have been removed. Rather than mentioning "caving" along with other recreational activities listed in the desired condition, the list of specific recreation activities has been removed and the Geological Features desired condition now states that biophysical features are generally undisturbed by human activities, which would include caving and other recreational activities. See FW-BioPhys-Geo-DC-1. A Recreation desired condition acknowledges that the Forest provides recreation settings that range from undeveloped (which offer opportunities for primitive character, challenging access, and solitude) to developed (which offer opportunities for more developed infrastructure, easier access, higher levels of social interaction, and increased user comforts). See FW-Rec-All-DC-4.

Concern Statement #472: The Forest Plan should retain the desired conditions that seek to ensure geological features are not diminished by recreational activities. See FW-BioPhys-Geo-DC-1 and 7. (70-1)

Response: This management direction has been retained in the Forest Plan, but rearranged to address the topics individually. For example, specialized habitats are addressed in separate desired conditions. See FW-BioPhys-Geo-DC-2 to 7. Instead of focusing on potential impacts from caving and rock climbing in the desired condition, the concern was converted into a more strategic guideline that seeks to maintain the integrity of these geological features regardless of the activity. See FW-BioPhys-Geo-G-1.

The desired condition related to potential impacts from rock climbing and other recreational activities duplicated other guidance in the Geological Features and Dispersed Recreation sections. To reduce

redundancy in the Forest Plan, this desired condition was merged with the plan components in these other sections. See FW-BioPhys-Geo-DC-1 and FW-Rec-Disp-DC-3.

Concern Statement #493: The Forest Plan should include direction on the accessibility and maintenance of cave records. (80-13)

Response: The Forest Plan has been adjusted in response to this comment. A management approach regarding cave records has been added to the Geological Features section. It reminds forest managers to:

> Keep cave locations confidential except for caves that have been identified for recreational use. Cave records are managed at Forest Service locations where they are kept secured.

Concern Statement #494: The Forest Plan should direct techniques that are disruptive to caves, karst, cliffs, and talus slopes to be avoided when possible and, if not possible, to mimic pre-disturbance conditions. (85-18, 85-20)

Response: The Forest Plan has been adjusted in response to this comment. The Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) guideline has been adjusted to emphasize avoiding alteration of these resources. The guideline also requires mitigations to mimic pre-disturbance conditions if alteration cannot be avoided. See FW-BioPhys-Geo-G-1.

Concern Statement #195: The guideline in the Paleontological Resources section of the Forest Plan that addresses fossil collecting (see Draft Revised Plan, FW-BioPhys-Paleo-G-2) should be adjusted to note that no collecting of paleontological resources should be allowed in a cave without a forest research permit. (80-18)

Response: This guideline has been adjusted to address part of your concern. Caves have been added to the list of areas that may be closed to collecting. See FW-BioPhys-Paleo-G-2. An unconditional closure of caves to collecting, as suggested by your comment, has not been incorporated into the revised Plan. The regulations found at 36 CFR Part 291 (Paleontological Resources Preservation) and the desired conditions and guidelines in the Paleontological Resources subsection of the Biophysical Resources section of the revised Plan provide direction on when closure of a specific area would be warranted. That is the type of site-specific decision that is not being made in the revised Plan.

Climate Change

Concern Statement #198: Some commenters requested that the Forest Plan and its Monitoring Plan have additional guidance associated with climate change. They suggested that the Forest Plan should:

- **contain plan components related to climate change and should protect large, old-growth and mature trees to mitigate climate change,**
- **have better links between climate change, plan components, monitoring, and federally listed and sensitive species,**
- **address drought management,**
- **require climate change to be an ongoing part of the evaluation process of determining whether desired conditions are being maintained or attained and what additional measures need to be taken, and**
- **include questions and monitoring metrics related to climate change, and**
- **require an active climate networking program that interacts and collaborates with state and local government, land owners, and the public.**

(56-8, 56-9, 74-37, 74-38, 74-39, 74-40, 74-41, 74-42, 74-58, 84-91, 87-1, 95-2)

Response: Regional guidance on climate change was used during plan development and this document has been referenced in the Climate Change Concerns section in Chapter 1 and added to Appendix D of the Forest Plan, which contains other sources of information. As stated in Chapter 1 of the Forest Plan, the nature of the Forest Plan is to maintain or manage toward desired conditions, regardless of current or changing conditions (e.g., climate change). Furthermore, the Forest Plan is intended to allow management of the Forest to adapt as necessary to continue moving toward ecological and social desired conditions. Rather than being confined to one section, climate change is addressed in numerous locations in the Forest Plan. For example, adaptability and resiliency to climate change or variability is mentioned in desired conditions in FW-Eco-DC-1, FW-Soil-DC-2, FW-Water-DC-3, FW-TerrERU-All-DC-2 and 4, FW-TerrERU-PP-DC-2, FW-TerrERU-MC-MCFF-DC-4, FW-TerrERU-MC-MCIF-DC-4, FW-TerrERU-SF-DC-4, and FW-WFP-DC-6.

In addition, plan language for the growth, maintenance, and protection of large, old trees is in numerous locations in the Forest Plan, including FW-TerrERU-PP-DC-6, 7, and 9, and FW-TerrERU-PP-G-1, 2, 3 (a pre-settlement tree strategy), and 4; FW-TerrERU-MC-MCFF-DC-2 and 4; FW-TerrERU-MC-MCIF-DC-2 and 4; FW-TerrERU-MC-All-G-2 and 3; and FW-TerrERU-DC-SF-2, 4, and 11. While protection of large, old trees is an important element of the Forest Plan, the Forest Plan also recognizes that management related to climate change may need to consider natural adaptation to changing conditions. A management approach regarding climate change has been added to the All Terrestrial Ecosystems section in response to these comments. This management approach reminds forest managers:

> In areas of high vulnerability to climate change, consider the following approaches to facilitate natural adaptation to changing conditions. Because many early-mid species or species characteristic of lower life zones are adapted for warmer and drier conditions, emphasize early-mid seral species or species from lower life zones over late-seral species and species of higher life zones. Consider managing tree basal area at the low end of the range of desired conditions to mitigate water stress.

The Forest Plan provides for wildlife and plant species, including federally listed and sensitive species, through plan components that address desirable and necessary habitat conditions for these species. Habitat conditions, including resiliency and adaptability to climate change and climate variability, are the key link between species, climate change, habitat, and monitoring. A coarse filter/fine filter approach was used to evaluate species. Each evaluated species was associated with its primary habitat (the coarse filter), and primary threats to the habitat were identified. Threats to the habitat constitute a threat to the species. Fine filter species-specific threats (such as disease) were also identified. This coarse filter/fine filter process was used to help develop and refine desired conditions, standards, and guidelines for the Forest Plan. Species-specific plan direction was developed where needed for threats that the Forest Service could impact through management and for which the Forest Service has jurisdictional control. This is discussed in detail in the Final Environmental Impact Statement.

The Forest Plan addresses drought either directly or indirectly as an aspect of resilient watersheds, riparian areas, and ecosystems. Drought is specifically mentioned as a natural disturbance in desired conditions in the All Ecosystems, Constructed Waters, and Grasslands sections (see FW-Eco-DC-1, FW-ConstWat-DC-2, and FW-TerrERU-Grass-DC-8) and in the General Description and Backgrounds for the sections on Stream Ecosystems, Wetlands, Riparian Forest Types, and Desert Communities. See also FW-Water-DC-1, FW-Water-G-2; FW-Rip-All-DC-5, FW-TerrERU-All-DC-1, FW-TerrERU-PP-DC-2, FW-TerrERU-MC-MCFF-DC-4, FW-TerrERU-MC-MCIF-DC-4, and FW-TerrERU-SF-DC-4. An exceptionally severe or extended drought could be an emergency situation, much like a wildfire, and site-specific responses could be generated at the forest or regional level or in collaboration with cities and counties, depending on the circumstances. Plan language is focused on planned activities and uses, not emergencies.

Monitoring and evaluation are required by the 1982 Planning Rule provisions. The purpose is to evaluate, document, and report how the Forest Plan is applied, how well it works, and if its purpose and direction remain appropriate. Based upon this evaluation, recommendations may be made to the Forest Supervisor to change management direction, or revise, or amend the Forest Plan. A required monitoring and evaluation report is intended to inform adaptive management of the Forest Plan area, especially in light of changing social or environmental conditions.

The Forest Supervisor annually evaluates the monitoring information displayed in the evaluation reports through a management review and determines if any changes are needed in management actions or the plan itself. In general, annual evaluations of the monitoring information consider the following questions (note that the third bullet has been modified to specifically bring attention to climate change):

- What are the effects of resource management activities on the productivity of the land?
- To what degree are resource management activities maintaining or making progress toward the desired conditions and objectives identified in the plan?
- Have there been unanticipated changes in conditions? Can changes can be attributed to climate change? What modifications are needed to account for these changed conditions?

In addition to annual monitoring, the Forest Supervisor reviews the conditions on the land covered by the Forest Plan at least every 5 years to determine whether conditions or demands of the public have changed significantly. The plan is ordinarily revised on a 10- to 15-year cycle and the Forest Supervisor may amend the plan at any time.

The Monitoring Plan in the Forest Plan has questions that relate to climate change and it can track the Forest's progress toward desired conditions and whether management activities are promoting resilient ecosystems, as well as provide indications about whether influences of climate change are hindering progress toward desired conditions. Two monitoring items have been added in response to these comments. One is related to water rights and water right filings, and the other would track peak flows and annual flows for three of our major streams. In addition, climate change and drought-related impacts can be derived from several items in the Monitoring Plan. Increased fires or fugitive dust facilitated by drought could impact air quality, or visibility in Class I areas (Questions 1 and 2). Drought or climate change could result in increased tree mortality that would be monitored in Question 4, which focuses on the frequency of snags and downed logs. Questions 5 and 6 would monitor changes in basal area in ponderosa pine and mixed conifer with frequent fire and reduction in the risk of uncharacteristic fire, which tie to climate change because the extent and severity of uncharacteristic fire could increase with increased temperatures and reduced precipitation. Question 14 would track the extent of uncharacteristic insect or disease outbreaks and could point to impacts from drought or climate change. Finally, the question that tracks plan amendments resulting from unforeseen events, could reflect changes in response to drought or climate change as well.

The Forest Plan does not require the creation of a climate networking program. Rather, as discussed above, management related to climate change is integrated in the plan direction for the various resource areas on the Forest. As projects, activities, and monitoring results are considered in light of this plan direction, forest managers will interact and collaborate with State and local government, land owners, and the public regarding the observed impacts of climate change on the Forest. A management approach regarding climate change has been added to the All Ecosystems section to remind forest managers to:

> Coordinate with Federal, State, and local entities, and other stakeholders regarding climate change research, trends, impacts, and adaptive strategies.

Concern Statement #384: The Forest Plan should address carbon sequestration by (1) conserving existing forests to avoid emissions associated with forest degradation or clearing; and (2) increasing forest carbon absorption capacity - primarily by planting trees or facilitating the natural regeneration of forests. (84-90, 84-92)

Response: The Forest Plan was developed in the context of a changing environment and takes into account the role of forests and forest management in carbon storage versus carbon emissions. Carbon storage was considered in the context of functioning ecosystems. See FW-Eco-DC-1, 2, and 3, and FW-TerrERU-All-DC-2.

Restoration treatments are pursued specifically to address, among other things, the risk of forest degradation as a result of uncharacteristic fire. The balance of carbon stocks resulting from restoration thinning treatments would vary based on site characteristics, tree densities, machinery used, wood utilization rates, the fate of wood products, and the reduction in wildfire threat. As described in the Air Quality section in the environmental impact statement, vegetation treatments can result in increased small smoke impacts in the short term. However, the release of emissions associated with restoration activities is offset by the reduced risk of uncharacteristic wildfires that have large smoke impacts in the long term.

As discussed in the Climate Change section in the Vegetation and Fire Specialist Report (Forest Service 2016a), uncharacteristic wildfires result in the release of high amounts of carbon into the air. However, restoration thinning may play a beneficial role in reducing greenhouse gases when it reduces the threat of wildfire-released carbon in the atmosphere and when carbon can be stored in wood products (Finkral and Evans 2008). The consistently high carbon storage and low carbon emissions of forests that are in conditions similar to pre-settlement fire-adapted forests (restored) suggest that low tree density, dominated by large, fire-resistant pines, may be a desired stand structure for stabilizing tree-based carbon stocks (Hurteau and North 2008).

Planting more trees beyond those required to promote and maintain the desired conditions may have a negative effect on long-term carbon storage because of the increased risk for uncharacteristic wildfires in unnaturally dense stands. However, both law and Forest Plan standards ensure that openings created with the intent of regeneration will be adequately restocked with trees within 5 years of final harvest (NFMA and FW-TerrERU-All-S-1). This will ensure that there is no long-term loss in carbon absorption capacity as a result of vegetation management activities.

Reforestation is also a concern on the Forest in deforested areas created by large wildfires, which have created substantial acres of reforestation need. The Forest has a strategy to assess, monitor natural regeneration, and when necessary plant trees to address these reforestation needs.

Concern Statement #741: The Forest Service must assess and disclose the potential contribution of multiple resource uses and management activities that may contribute to or compound ongoing changes to the regional and global climate system including, but not limited to: (1) groundwater extraction; (2) surface water diversions and withdrawals; (3) continued use of existing roads and trails; (4) development of new roads and trails; (5) livestock grazing; (6) fire and fuel management; (7) minerals development; (8) logging; and (9) spread of invasive species.

Response: The Climate Change section in chapter 3 of the environmental impact statement discusses the potential environmental consequences of climate change and compares how the different alternatives address these consequences. This section includes the following information.

There is considerable uncertainty about the extent and degree to which climate change is affecting and will affect lands and resources on the Forest; however, based on current projections, the most likely primary effects of climate change include: warmer temperatures, decreasing precipitation, increased

extreme disturbance events (storms and flooding), decreased water availability with increased demand, and increased use of the Forest for relief from increased temperatures. Warmer temperatures and decreasing precipitation could affect wildfire risks, insects, disease, and invasive species; structure, composition and distribution of vegetation; and species abundance and distribution. There could be increases in the frequency and severity of wildfires and population growth could contribute to greater numbers of human-started fires. Less precipitation may fall as snow, snow may melt earlier in the spring, and stream flow may peak earlier in the year, affecting aquatic and riparian resources. Extreme disturbance events include changes in the composition and diversity of desired ecosystems; habitat destruction; loss of trees; increased damage to trails, facilities, roads and other infrastructure; increased erosion; modifications to stream channels outside of the historic range of variation; and loss of recreational opportunities. Increased variation in temperature and precipitation could stress ecosystems and increase susceptibility to outbreaks of insects, diseases, and non-native invasive species. Species composition and species richness could be altered. Species with a narrow range of adaptability could become less common and those with a broader range of adaptability or more aggressive colonization abilities could become more prevalent. The distribution and abundance of plant and animal species could also be altered in response to shifts in migration, flowering, fruit ripening, appearance and emergence of insects, and timing for foraging and reproductive activities. Resource availability, reproductive output, and survivorship could change depending on the species dispersal ability, extent, location, and magnitude of landscape disturbances and inter-relationships between the species and weather, land use, land cover, hydrology, fire, and stressors.

Some possible outcomes include long-term shifts in vegetation patterns such as from forests to other vegetation types, changes in land productivity, cold-tolerant vegetation and animal species moving upslope or disappearing in some areas, and migration of some tree species north of their existing range. Shifts in vegetation could isolate and fragment habitats and create barriers to movement.

The Forest Plan contains plan components that address some these projected effects. For example, with a projected increase in extreme weather events, plan components have soil management practices to help mitigate erosion such as best management practices or aquatic management zones. See FW-Water-G-4, FW-BioPhys-Geo-G-8, FW-Soil-G-1, FW-ConstWat-G-1, FW-Rip-All-G-3, FW-Rip-Strm-G-2, and FW-RdsFac-G-5.

The revised plan provides a framework to be used with existing law, regulation, and policy to guide, but does not authorize uses, projects, and activities on lands managed by Coconino NF. Because the revised plan does not authorize uses and activities, there are no direct effects that can combine with global and national climate change. It is not feasible to quantify the contributions of activities and uses (such as groundwater extraction, use of existing roads and trails, existing surface water use and diversions, livestock grazing, invasive species, logging) because of the complexity and magnitude of global and national climate change; the scale and intensity of local stressors (such as insect and disease, drought) and because of the uncertainty associated with location, timing, frequency, and intensity of these uses and activities.

The Climate Change section in chapter 3 of the environmental impact statement has additional information and analysis on how plan components address other projected effects. In addition, the Water Quality, Quantity, and Watershed section in chapter 3 of the environmental impact statement discusses the impacts of groundwater extraction and existing surface water use and diversions. The Soil section in chapter 3 of the environmental impact statement includes vegetative treatments (which could include logging), livestock and elk herbivory, and the establishment and use of roads and trails as part of the affected environment for soil condition and productivity. Other factors that contribute to current departure and trends of soil condition are dispersed recreational and off-highway vehicle use, the absence of fire at historic frequency and severity, and drought. These factors were considered collectively, not individually.

The use of existing roads and trails is also discussed in the sections on Riparian Resources, Infrastructure and Facilities, and Special Areas (see Geological and Botanical Areas). Development of new roads and trails is discussed in the section on Infrastructure and Facilities under transportation suitability in the environmental impact statement. Logging, livestock grazing, and invasive species are discussed in numerous locations in chapter 3 of the environmental impact statement and this information can be accessed by conducting keyword searches on the terms "livestock," "invasive," "logging," and "vegetative treatment." Fire and fuel management are discussed in the sections on Air Quality, Vegetation and Fire, and Fire Management in chapter 3 of the environmental impact statement.

Additional text has been added to the Vegetation and Fire section in the environmental impact statement that discloses the potential environmental effects with respect to carbon storage and sequestration. In summary, scientific literature on the role of forests and forest management in carbon storage versus carbon emissions indicates that many complex variables and tradeoffs must be considered. In general, according to Ryan et al. 2010, North and Hurteau 2011, Hurteau et al. 2010, North et al. 2009, Hurteau and North 2009, Finkral and Evans 2008, and Dore et al. 2010, treatments that prevent deforestation, reforest severely burned forests, retain the majority of large trees, retain soil organic reserves, increase health and growth rates of existing forests and herbaceous vegetation, and convert trees into durable wood products retain and improve carbon storage. Use of biomass energy can reduce fossil fuel carbon emissions. Exhaust from harvesting and industrial operations and from wildland fire would cause carbon emissions. However, these activities can reduce greater pulses of carbon emitted from large stand-replacement wildfires in addition to preventing large-scale losses of forests as important carbon sinks.

Concern Statement #761: The Forest Plan should require the environmental analyses for all site-specific projects to consider the foreseeable cumulative effects of climate change to the affected environment. (84-98)

Response: A standard requiring the cumulative effects of climate change to be analyzed for every site-specific activity has not been added to the Forest Plan. An analysis of cumulative effects is required by existing regulation and policy. See 36 CFR 220 (f), Forest Service Handbook 1909.15 National Environmental Policy Act Handbook, 15.1 - Cumulative Effects, and Climate Change Considerations in Project Level NEPA Analysis (January 13, 2009). These regulations and policies are not repeated in Forest Plan.

Topics analyzed in an environmental document are determined at the project level based on the resources involved and comment received through the scoping process. While climate change may frequently be a topic analyzed in the cumulative effects in environmental documents, the Forest Plan does not arbitrarily require such an analysis in every environmental document.

Concern Statement #383: The discussion on Climate Change Concerns in Chapter 1 of the Forest Plan should be adjusted to note that ecosystems "adapt to" changes in disturbance patterns rather than "withstand" those changes. The current recognized and applied definitions of ecological resilience basically refer to the ability of an ecosystem to either resist, recover from, or adapt to disturbance. (58-1)

Response: The Climate Change Concerns section in chapter 1 of the Forest Plan has been adjusted in response to this comment. The term "withstand" has not been removed as suggested because the term fits within the definition of ecological resiliency offered by the commenter. However, the terms "recover from" and "adapt to" were added to this sentence because they help provide a better representation of what resiliency means in this context.

Fisheries and Aquatic Habitat

Concern Statement #31: "The Forest Service should adopt an ecosystem-scale aquatic conservation strategy for management of aquatic habitat and at-risk fisheries similar to the one adopted in the Pacific Northwest:

- **Designate "key watersheds" in large drainage basins that offer the highest quality aquatic habitat;**
- **Establish "riparian reserves" to maintain and restore aquatic habitat;**
- **Enact standards and guidelines for management in riparian reserves that require project-level actions to meet objectives related to physical, chemical and biological aspects of aquatic ecosystems;**
- **Require watershed analysis at the scale of large drainage basins to account for such factors as road density, vegetation cover and ecological processes that contribute to aquatic habitat quality;**
- **Compel active restoration of aquatic ecosystems in compliance with standards and guidelines for riparian reserves; and**
- **Prohibit use of site-specific mitigation measures or planned restoration activities as a substitute for preventing degradation of existing high-quality aquatic habitat. (84-35, 84-102)**

Response: The Forest Plan recognizes the need to maintain, improve, and restore watersheds, riparian areas, and aquatic habitat and their associated species on the Coconino NF. The primary approaches of the plan to address these issues are through ecosystem restoration of the various ecological response units (ERUs) across the landscape, addressing degraded watershed conditions, and improving conditions within riparian areas and their associated aquatic habitats and species. Numerous objectives, desired conditions, standards, and guidelines have been developed for each of these for improving conditions by reducing historical, ongoing, and potential impacts through restoration activities and moving toward desired conditions through project implementation.

Although key watersheds have not been specifically designated in the Forest Plan, a guideline in the Watersheds and Water section of the Forest Plan focuses watershed restoration and maintenance, and vegetation treatments, on priority 6th code watersheds to ensure that ecosystem processes, resilient vegetation conditions, and natural disturbance regimes are functioning properly. See FW-Water-G-2.

Instead of using a "riparian reserve" approach to maintain and restore aquatic habitat, the Forest Plan has direction related to riparian areas, water, watersheds, aquatic habitat, and aquatic species in a variety of places, most prominently in Watersheds and Water, Riparian Areas, and Wildlife, Fish, and Plants. Some of the desired conditions and guidelines that promote resiliency, hydrologic, physical, chemical, and biotic integrity, maintenance of physical and natural processes, base flow, riparian communities, groundwater recharge, and species diversity include FW-Water-DC-1, 2, 3, 5, 6, and 7; FW-Water-G-3 and 6; FW-Rip-All-DC-1, 2 and 4, FW-Rip-Strm-DC-1 to 4, FW-Rip-Strm-G-1, FW-Rip-Wtlnds-DC-1 and 2, FW-Rip-Spr-DC-1 to 5, FW-Rip-Spr-G-1, 3, and 4, FW-Rip-RipType-DC-1, 2, 4, 5, and 6, FW-Rip-RipType-G-1, 3, and 4, FW-WFP-DC-3, 4, and 5, FW-Invas-DC-1 and 2, FW-Invas G-1 and 2, FW-Graz-G-4, 5, and 7, FW-RdsFac-G-5 and 9, FW-Rec-All-G-2, and FW-Rec-Disp-G-5.

The Forest Plan directs the design and implementation of buffers, called aquatic management zones, in riparian areas to avoid detrimental changes that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. See FW-Rip-All-G-3. Aquatic management zones would also be established in non-riparian, intermittent streamcourses to maintain channel functioning, downstream water quality, riparian habitat, and function. See FW-Rip-Strm-G-2.

On the Coconino NF, road density and use are addressed through the implementation of the Travel Management Rule and the plan has language to support that implementation. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1.

The Forest Plan does not prescribe the scale at which project-level analyses are done; however, it does have plan direction that is intended to be applied at all scales.

The Forest Plan has objectives to restore the function of non-functioning and functioning-at-risk riparian areas with emphasis on priority 6th code watersheds; to restore 5 to 10 wetlands not in proper functioning condition; to restore riparian function to at least 25 springs identified as not in proper functioning condition; and to restore or enhance at least 70 miles of stream habitat. See FW-Rip-Wtlnds-O-1, FW-Rip-Spr-O-1, and FW-WFP-O-4.

Concern Statement #50: The Forest Plan should recognize that aquatic barriers can be desirable to prevent more than just the movement of fish. (86-15)

Response: In response to your comment, this desired condition was separated into two desired conditions. One of the desired conditions addresses the general desire for connectivity along streams. See FW-Water DC-4. The other desired condition more directly addresses your comment regarding the situational desirability of barriers in streams to restrict passage of aquatic species, not just non-native fish. See FW-WFP-DC-9.

Forest Products

Concern Statement #221: The Forest Plan should require a buffer area to be created between existing trails and timber harvest areas, should require that trails not be used for timber extraction routes, and should include additional direction to mitigate the visual impacts of logging operations on trail users. (72-9)

Response: The Forest Plan was not modified to include a specific buffer between harvested areas and existing recreational trails. The concern regarding impacts to recreational activities from the harvest of forest products is addressed in other ways by plan components. FW-FProd-DC-2 and FW-FProd-G-2 ensure that timber-cutting techniques consider recreational opportunities and recreation desired conditions. Guidelines for scenic resources also address the concerns that can be associated with timber harvest. See FW-Scenic-G-3 and 4. Overdevelopment of single-track trails is addressed by a desired condition for Trails. See FW-Rec-Trails-DC-3.

Concern Statement #415: The Forest Plan should prohibit commercial timber harvests and road construction in recently burned areas of the forest, except when necessary for public safety. (110-4)

Response: The Forest Plan has been adjusted in response to this comment. Although the Forest Plan does not expressly prohibit commercial timber harvest or road building as suggested, a management approach has been added to the All Ecosystems section reminding forest managers to focus on health and safety, restoration, and stabilization after large, uncharacteristic disturbances. The management approach states:

> Following large or uncharacteristic disturbance events, focus management actions on human health and safety, long-term restoration, soil and watershed stabilization, and restoration or protection of ecosystem processes and resource values.

The Forest Plan contains other components that are designed to ensure that activities are consistent with the desired conditions for other resources. For example, the Forest Plan includes a guideline requiring timber harvest activities to be designed to be consistent with maintaining or moving toward ecological and social desired conditions. See FW-FProd-G-1. A similar guideline can be found in the Roads and Facilities section. See FW-RdsFac-G-1.

Decisions on whether to conduct a commercial timber harvest or to build roads in a burned area are made at the project level based on site-specific information and analysis. Imposing such restrictions without consideration of specific circumstances could prevent the Forest from pursuing desirable restoration activities or require a plan amendment before those activities could be pursued.

Concern Statement #416: The Forest Plan should clearly include size and location restrictions on the gathering of dead and downed logs. Furthermore, the Forest Plan should restrict the removal of snags and the removal of firewood from Mexican spotted owl Protected Activity Centers and northern goshawk post-fledging areas. (56-196, 56-197)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan is programmatic in nature and does not make specific decisions on size and location restrictions related to firewood collection. Any specific restrictions on firewood collection would be addressed site specifically at the project level.

The Forest Plan provides a framework to guide project-level decisions on firewood collection in the future. For example, the Forest Products section includes a desired condition to provide sustainable supply of forest products (which includes firewood) consistent with other resource desired conditions. See FW-FProd-DC-1. Desired levels of snags and dead and downed logs are discussed in the Riparian and Terrestrial ERU sections of the Forest Plan. See FW-TerrERU-MC-MCFF-DC-3, FW-TerrERU-MC-MCIF-DC-3, FW-TerrERU-PP-DC-5, and FW-TerrERU-PJ-DC-2. A Wildlife, Fish, and Plants section desired condition addresses the desire for snags and large downed logs to be present in all forest and woodland ERUs, providing habitat for the associated species. See FW-WFP-DC-7. Plan components such as these will guide project-level decisions that authorize the collection of firewood.

Concern Statement #518: The Forest Plan desired condition related to collection of forest botanical products (see Draft Revised Plan FW-FProd-DC-4) should require permits for the collection of botanical products and only permit collection if the botanical products will sustainably persist on the Forest. (74-75)

Response: The Forest Plan has been adjusted in response to this comment. The desired condition that discussed the need for (1) a permit to collect, (2) the collection of rare plants, and (3) the collection of forest products by tribes has been broken up to reflect these three thoughts.

The suggestion that any collection would need to be authorized by a permit has been dropped from the plan. Collection of forest botanical products is covered by 36 CFR 223 subpart H and FSH 2409.18, Chapter 80, Uses of Timber Other Than Commercial Timber Sales, Special Forest Products - Forest Botanical Products. Because collection of botanical products for personal use is covered by regulation (36 CFR 223 subpart H) and a permit is not always required, the reference to a permit has been removed. However, the Forest Plan does provide direction on commercial plant collection activities, which are not permitted in the Red Rock, Oak Creek Canyon, and Sedona Neighborwoods MAs. Removal of commercial national forest products is by permit at designated locations only in the Red Rock MA, House Mountain-Lowlands, Sedona Neighborwoods Management Area. See MA-RedRock-S-6, MA-OakCrk-S-1, 3, MA-HouseMtn-S-1, and MA-SedN-S-1, 3.

While a permit may not be necessary in all situations, a guideline has been added to ensure that the collection of species that are rare, limited in distribution, or on the Southwestern Region's sensitive species list should not be authorized unless the species can withstand collection and will persist on the Forest. See FW-FProd-G-4.

Concern Statement #592: The Forest Plan should manage the collection of forest botanical products by tribes in a manner that allows collection locations to remain secret. (56-75)

Response: The Forest Plan has been adjusted in response to this comment. The desired condition that discussed the need for (1) a permit to collect, (2) the collection of rare plants, and (3) the collection of forest products by tribes has been broken up to reflect these three topics.

The suggestion that any collection would need to be authorized by a permit has been dropped from the plan. Collection of forest botanical products is covered by 36 CFR 223 subpart H and FSH 2409.18, Chapter 80, Uses of Timber Other Than Commercial Timber Sales, Special Forest Products - Forest Botanical Products. Because collection of botanical products for personal use is covered by regulation (36 CFR 223 subpart H) and a permit is not always required, the reference to a permit has been removed. However, the Forest Plan does provide direction on commercial plant collection activities, which are not permitted in the Red Rock, Oak Creek Canyon, and Sedona Neighborwoods MAs. Removal of commercial national forest products is by permit at designated locations only in the Red Rock MA, House Mountain-Lowlands, Sedona Neighborwoods Management Area. See MA-RedRock-S-6, MA-OakCrk-S-1, 3, MA-HouseMtn-S-1, and MA-SedN-S-1, 3.

While a permit may not be necessary in all situations, a guideline has been added to ensure that the collection of species that are rare, limited in distribution, or on the Southwestern Region's sensitive species list should not be authorized unless the species can withstand collection and will persist on the Forest. See FW-FProd-G-4.

The remaining direction relating to the collection of forest products by tribes has been retained as a desired condition. See FW-FProd-DC-3.

In addition to the adjusted desired condition, several management approaches have been added to the Forest Products section to remind forest managers to:

> Recognize the needs of members of tribes whose historic ties include the land now administered by the Coconino NF to collect forest materials for traditional, ceremonial, and subsistence purposes.
>
> Work with tribal members to facilitate collection of forest products needed for traditional activities and ceremonial uses.

All of these changes help ensure that forest product collection locations will remain secret.

Heritage Resources

Concern Statement #563: The Forest Plan should provide detailed information on the compliance process the Forest used for heritage resources to ensure consistent application across all areas of the Coconino NF. (69-16)

Response: In general, heritage compliance is guided by numerous laws, regulations, and policies. Applicable regulations would vary by the project and what heritage resources are potentially affected. Regulations are listed in the Forest Plan appendix D under "Heritage Resources, Tribal Relations, and Uses."

To help add consistency across Forest Service administrative boundaries, a management approach has been added to the Special Uses section to remind forest managers from different administrative units to coordinate on the management of utility facilities that traverse multiple administrative units. This coordination should provide permit holders with greater consistency on process and operation requirements. It states:

When utility facilities traverse National Forest System lands administered by more than one ranger district within the Coconino NF, coordinate with utility companies in the development of regular operating plans to document agreements and activities along these corridors for consistent and seamless decisions where appropriate, that can be integrated along whole linear rights-of-way or utility corridors.

Concern Statement #332: The Forest Plan should explain how the Report to the Secretary of Agriculture, USDA Policy and Procedures Review and Recommendations: Indian Sacred Sites (2012) will apply. (50-1, 56-71)

Response: As a general rule, the Forest Plan includes references to applicable laws, regulations, policies and other information in appendix D, Other Sources of Information. The Indian Sacred Sites Report has been added to the Heritage Resources, Tribal Relations, and Uses section in appendix D of the Forest Plan. As noted in the executive summary, the Report does not, by itself, change policy or have any effects, significant or otherwise, on the human or natural environment and does not constitute final agency action. The Report is a review of law, policy, and procedures, with recommendations for changes based on Tribal consultation and public comments. Including the Report in appendix D of the Forest Plan provides a reminder to forest managers that this Report is available as a resource when sacred sites are involved.

Concern Statement #596: The Forest Plan should include direction on the protection of sites that meet the criteria of eligibility for the National Register of Historic Places. (56-64)

Response: The plan components in the Heritage Resources section of the Forest Plan provide a framework that will guide decisions on how to manage and protect the heritage resources on the Forest, including the sites that are eligible for the National Register of Historic Places. How a particular site will be managed and protected is a project-level decision that will be based on site-specific information.

Concern Statement #724: The Forest Service should adhere to the Memorandum of Understanding Among the U.S. Department of Defense, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Department of Energy, and the Advisory Council on Historic Preservation Regarding Interagency Coordination and Collaboration for the Protection of Indian Sacred Sites (2012). (53-6)

Response: The Forest Plan has been adjusted in response to this comment. The Indian Sacred Sites Memorandum of Understanding has been added to the Heritage Resources, Tribal Relations, and Uses section in appendix D of the Forest Plan.

The Forest is currently taking many steps to implement the provisions of the Indian Sacred Sites Memorandum of Understanding. For example, the Forest's Tribal Relations Specialist provides training for the Coconino NF's Forest Protection Officers. The Coconino NF consults with tribes as needed, and the Forest is in the process of developing several memorandums of understanding with several tribes. The United States Department of Agriculture Forest Service has created a website devoted to tribal relations (http://www.fs.fed.us/spf/tribalrelations/). The Coconino NF engages in public outreach through site stewards, volunteers, and universities. The confidentiality of all archaeological and cultural data is protected. The Coconino NF also provides guidance tribal consultation to State, corporate (archaeological contractors), and local governments.

Concern Statement #594: The Forest Plan should include direction for the prehistoric, historic, and settlement history of the Beaver Creek Area to be an integrated part of interpretive programs throughout the area. (99-6)

Response: Although a Beaver Creek Management Area has not been identified as part of the Forest Plan, in response to your comments the Verde Valley Management Area plan components were reviewed,

edited, and augmented. For example, additional information on the prehistoric, historic, and settlement history of this area has been added to the General Description and Background for the Verde Valley Management Area. The desired condition for the prehistoric, historic, and settlement history of the Verde Valley to be an integrated part of interpretive programs throughout the area has been retained. See MA-VerdeV-DC-5. Additional guidance on interpretation is located in the forestwide Interpretation and Education section. There is also forestwide direction in Heritage Resources to emphasize the interpretation of human history on the Forest to promote greater public understanding and appreciation of the prehistoric and historic cultures and communities. SeeFW-Hrtg-DC-5, 7, 8 and 12.

Concern Statement #676: The Forest Service should develop a memorandum of understanding or memorandum of agreement related to the Arizona Snowbowl special use authorization. The Forest Service should have transplanted or harvested medicinal plants before construction under this special use authorization occurred. (53-4)

Response: Implementation of project-level decisions is outside the scope of the Forest Plan.

A Memorandum of Agreement (MOA) between the United States Department of Agriculture Forest Service, Coconino National Forest, the Advisory Council on Historic Preservation, and the Arizona State Historic Preservation Office was signed when the Record of Decision was issued in 2005, regarding the construction of improvements at the Arizona Snowbowl. Under the MOA, the Coconino NF is required to inform tribes that have a special connection with the San Francisco Peaks of actions that are proposed by the Arizona Snowbowl. Those notifications have been occurring as required under the MOA. Part of the purpose of the notice required by the MOA is to give tribes an opportunity to identify and transplant or harvest medicinal plants that occur in the construction area.

Eligible and Suitable Wild and Scenic Rivers

Concern Statement #470: The Forest Plan should include wild and scenic river management direction for a 6.7-mile segment of the Upper Verde River that is shared with the Prescott National Forest. (56-121)

Response: Several adjustments have been made to the Forest Plan in response to this comment. A table identifying the designated and eligible wild and scenic rivers on the Coconino National Forest has been added to the Designated and Eligible Wild and Scenic Rivers section of the Forest Plan. The table lists the 6.7-mile segment of the Upper Verde River as eligible for a recreational classification. See Table 8 in the Forest Plan. Information on each designated and eligible wild and scenic river has been added to the General Description and Background for the Designated and Eligible Wild and Scenic Rivers section. The information on the Upper Verde River segment explains that this segment is administered under Prescott NF Forest Plan direction. The eligibility report prepared by the Prescott National Forest on all of the Upper Verde River eligible river segments has been listed in the Forest Plan in the Designated and Eligible Wild and Scenic Rivers section in appendix D, Other Sources of Information.

In the event that administration of the eligible Upper Verde River segment is returned to the Coconino NF, the Forest Plan has components that address eligible river segments. See SA-WSR-DC-1, 2, and 4, and SA-WSR-G-1. A management approach has also been added to this section to remind forest managers to coordinate with neighboring forests on the management of designated and eligible wild and scenic rivers.

Invasive Species

Concern Statement #231: The Forest Plan should contain direction that will decrease the presence of non-native fish to provide for the recovery of native fish. (56-4)

Response: The Forest Plan contains plan components designed to ensure that native species are protected. Three desired conditions address habitat for native species. See FW-WFP-DC-1, 2, and 3. Three more desired conditions specifically address native aquatic and fish species. See FW-WFP-DC-4, 9, and 10. Two guidelines include the use of species protection measures and objectives from approved recovery plans and complying with species conservation agreements, assessments, strategies, or national guidelines. See FW-WFP-G-1 and 2. A guideline requires projects to be designed or managed to maintain or improve habitat for native species and reduce the threat of disease. See FW-WFP-G-3.

Finally, several management approaches in the Wildlife, Fish, and Plants section provide suggestions related to native species. They remind forest managers to:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.
>
> Maintain the native-fish-only status of Fossil Creek and streams free of non-natives through public education, signs, and law enforcement.

Nonnative fish would also be addressed by some plan components in the Invasive Species section.

The term "invasive species" is defined in the glossary as:

> Any species that is non-native (or alien) to the Forest and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health. Invasive species can be identified within any of the following four taxonomic categories: Plants, Vertebrates, Invertebrates, and Pathogens. There is a link to Federal and State invasive plant species lists on the U.S. Department of Agriculture, Natural Resource Conservation Service website. The National Invasive Species Information Center provides information on invasive vertebrates, invertebrates, and microbes.

A desired condition in the Forest Plan Invasive Species section seeks for invasive species to be absent or existing at levels where they do not disrupt ecological composition, structure, and function; do not disrupt the natural fire regime; or do not affect the sustainability of native and desirable non-native species. See FW-Invas-DC-1.

Concern Statement #219: The Forest Plan should be adjusted to address weeds/invasives of concern in the desired conditions for each vegetation type, or by reference to summary table. (75-57)

Response: References to individual invasive species and noxious weeds have not being added to the desired conditions for each ecological response unit because the species listed as invasive and noxious change over time. However, there are a several plan components that address invasive and noxious weeds regardless of where they occur. See FW-Invas-DC-1 and a management approach for Invasive Species, which states:

> Maintain a current inventory of invasive species on forest lands. For plant inventories, prioritize areas of unique and rare habitats first, areas of high use and disturbance second (e.g., material pits, trailheads, campgrounds, corrals, roads, boat ramps, and bridges), and areas where invasive species are just getting established.

Concern Statement #290: The Forest Plan should include an objective to implement integrated pest management approaches and other treatments to control invasive species within three (3) years of plan approval. (74-74)

Response: Integrated pest management is an ongoing process and is considered based on site-specific information as a proposed activity is being considered or as part of an ongoing weed management program. Integrated pest management is incorporated into Forest management activities project by project based on site-specific information.

Concern Statement #365: Invasives should be written into the direction for creation of a "Neighborwoods"-specific management patrol monitoring recreation impacts –guaranteed to increase in the next 15 years. Specific attention should be paid to dispersed campers and recreational shooters along the Kelly Motorized Trail System (see also section in this document addressing recreational shooting) as mechanized users spread invasives within the National Forests' "Neighborwoods." Shooting areas tend to get trampled and denuded of vegetation, allowing invasives to establish, displacing natives with negative long-term effects. Effects will occur as users recreate at dispersed sites, denuding vegetation. Native vegetation replacement by invasives is serious because loss of natives "can alter fire regimes and increase erosion in localized areas." (DEIS v1 p. 462) (56-104)

Response: The forestwide Invasive Species section in the Forest Plan addresses how to manage the spread and treatment of invasive species, wherever they occur. The Forest Plan does not make decisions on specific actions such as those suggested in the comment, but those actions could be considered and implemented at the project level after consideration of site-specific information. In addition there is a guideline in All Recreation that would require visitors with recreational stock to carry certified weed-free feed to prevent the spread of invasive plants. See FW-Rec-All-G-6.

Concern Statement #422: The Forest Plan should clearly identify the equipment that should be cleaned, disinfected, and inspected using current decontamination protocols to remove plants, fish, or animals so organisms are not transported among water bodies and healthy forest habitats. (69-13, 69-14)

Response: These guidelines have been removed from the Forest Plan because their intent is addressed in the Invasive Species section. See FW-Invas-G-1. The guideline in the Invasive Species section is written to have more strategic application, with the precise details of how to prevent infestations being determined at the project level based on the specifics associated with the project. As a forestwide component, this guideline applies to all projects and activities where control of invasive species is identified as a concern.

The Invasive Species section also has a management approach reminding forest managers to think about the role vehicles, equipment, personnel, and materials can play in the accidental introduction and spread of invasive species. It states:

> Encourage the prevention of accidental introduction and spread of invasive species carried by contaminated vehicles, equipment, personnel, or materials (including plants, wood, plant/wood products, water, soil, rock, sand, gravel, mulch, seeds, grain, hay, straw, animal feeds, or other materials).

Concern Statement #480: The Forest Service should incorporate the guidance from the document titled "Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest Lands in Arizona" and from the associated Memorandum of Understanding into the revised Plan. Consideration of normal maintenance and preservation

activities conducted by the Arizona Department of Transportation should also be incorporated into the revised Plan so future plan amendments would not be needed. (83-2)

Response: The Forest Plan has been adjusted in response to this comment. A reference to the Amended Memorandum of Understanding regarding the construction, operation and maintenance of highways in Arizona crossing National Forest System Lands has been added to the Roads and Facilities section in appendix D, Other Sources of Information.

Concern Statement #528: The Forest Plan should clarify the distinction between noxious and invasive plant species. (75-56)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan refers to invasive and noxious species collectively as an invasive species. See definition of "noxious weed" in the Glossary of the Forest Plan. The guidance for invasive species is generally included in the Invasive Species, All Ecosystems, and Wildlife, Fish, and Plants sections. References to individual invasive species are not included because the species identified as invasive change over time. The definition of "invasive species" in the Glossary identifies the U.S. Department of Agriculture, Natural Resource Conservation Service as the source for the Federal and State invasive plant species lists and the National Invasive Species Information Center as a source of information on invasive vertebrates, invertebrates, and microbes.

Concern Statement #653: The Forest Plan should adjust the Invasive Species desired condition that provides examples of invasive species (See Draft Revised Plan FW-Invas-DC-1) to include a complete list of invasive species or reference existing lists of invasive species. (75-99)

Response: The Forest Plan has been adjusted in response to this comment. The few specific examples of invasive species that were mentioned in the desired condition have been removed and the language describing what an invasive species is has been moved to the General Description and Background for the Invasive Species section.

Although lists of invasive species are available from a number of sources, no specific list of species is being incorporated into a plan component because the lists change over time. Incorporating a list into a plan component would require the Forest Plan to be amended as the list changes. Instead of incorporating a list into a plan component, the Invasive Species section in appendix D of the Forest Plan mentions one of the list sources, the U.S. Forest Service Invasive Species Program website.

Concern Statement #710: The Forest Service should discuss the presence of and impacts associated with non-native trout. (24-7, 55-5)

Response: The presence and impacts of non-native fish has been discussed in several documents associated with the forest plan revision effort. In several places in the Wildlife, Fish, and Plants section, the environmental impact statement discusses how non-native fish can have significant impacts because they eat, compete with, and can hybridize with native species and can transfer parasites to native fish. Other documents with information on this subject include the Ecological Sustainability Report (USDA Forest Service 2009a), Biological Assessment (USDA Forest Service 2017a), and the Species Viability Report and Biological Evaluation for Plants and Terrestrial Wildlife (USDA Forest Service 2017b)

Concern Statement #713: The Forest Service should analyze the impacts of crayfish, an invasive species, on native species. (24-5)

Response: Crayfish are analyzed in the Wildlife, Fish, and Plants section of the environmental impact statement as one of the invasive animal species.

Inventoried Roadless Areas

Concern Statement #666: The Forest Service should provide a summary of the Inventoried Roadless Areas on the Forest and explain how they were considered during the wilderness evaluation process as required by 36 CFR 219.17. (74-26)

Response: The Forest Plan has been adjusted in response to this comment. An Inventoried Roadless Area section has been added to the Special Areas section in chapter 3 of the Forest Plan to provide a summary of the Inventoried Roadless Areas on the Forest. This section identifies the nine Inventoried Roadless Areas on the Forest and provides a desired condition and a standard designed to maintain the overall roadless character of these areas. See SA-IRA-DC-1 and SA-IRA-S-1. The Inventoried Roadless Areas have been added to Map 2 in the Forest Plan to display where they are located.

36 CFR 219.17 states that "roadless areas within the National Forest System shall be evaluated and considered for recommendation as potential wilderness areas during the forest planning process. During the wilderness evaluation process for the Coconino NF forest plan revision effort, the inventory began at the forest level to identify all potential areas that met the initial criteria. See the description of the Inventory Process in Appendix A of the Potential Wilderness Area Evaluation Report (USDA Forest Service 2016b). By considering all lands on the Forest in the inventory process, the Inventoried Roadless Areas on the Forest were evaluated and considered as required by 36 CFR 219.17. According to the Potential Wilderness Area Inventory Process described in the Wilderness Evaluation Report (USDA Forest Service 2016b), the Forest looked at areas of 5,000 acres or more that did not have permanently authorized roads. This put all or substantial portions of the Walker Mountain, Boulder Canyon, Cimarron Hills, Hackberry, and Padre Canyon inventoried roadless areas into the inventory of potential wilderness areas that were then further evaluated for capability, availability, and need. The Forest chose to include two Inventoried Roadless Areas that are smaller than 5,000 acres (Barbershop and East Clear Creek) in the potential wilderness area inventory because of the 1982 Planning Rule Provisions at 219.17(a)(1)(i) and it was determined that they could be preserved due to physical terrain and natural conditions. Because the inventory is only the first step of evaluation, the Inventoried Roadless Areas were then considered for capability, availability, and need. Some were removed in these subsequent steps because they did not rank highly in them. For more information, see the Potential Wilderness Area Evaluation Report (USDA Forest Service 2016b), which is available on the Coconino NF's website at: http://www.fs.usda.gov/project/?project=32780.

Lands and Special Uses

Concern Statement #239: The Forest Plan should include direction that allows possible upgrades of existing facilities, construction of new facilities, and continuous access to conduct operation and maintenance activities on these facilities. (43-4)

Response: The Forest Plan does not make decisions that would allow specific upgrades to existing facilities, construction of new facilities, or access to these facilities. Decisions on requests such as those can only be made after consideration and analysis of site-specific proposals.

The Forest Plan does include plan components related to electric power facilities and other special uses in the Special Uses sections. This section contains desired conditions, guidelines, and management approaches related to the management of electric power facilities located on the Forest. For examples, see FW-SpecUse-DC-2, 3, and 5, FW-SpecUse-G-5, 6, 7, 8, and 9, and several management approaches in the Special Uses section, which remind forest managers to:

> Encourage proponents to involve the Forest early in the special-use permit proposal development process.

> Consider processing right-of-way grants by priority; first priority being the public interest and national forest needs.
>
> When utility facilities traverse National Forest System lands administered by more than one ranger district within the Coconino NF, coordinate with utility companies in the development of regular operating plans to document agreements and activities along these corridors for consistent and seamless decisions where appropriate, that can be integrated along entire linear rights-of-way or utility corridors.

Concern Statement #738: The Forest Service should include utility corridor rights-of-way in the list of Issues identified in the environmental impact statement. (43-3)

Response: The theme of utility corridor rights-of-way is already addressed in major issues identified for this planning effort. The Issues section in chapter 2 of the environmental impact statement includes a category titled Use/Management Issues. Several specific examples are listed in the Use/Management Issues category, including:

> Language in the proposed revised plan might unnecessarily restrain access/use of the Forest for future energy infrastructure needs.

This statement incorporates the commenter's concerns about utility corridor rights-of-way. Plan components related to management associated with utility corridor rights-of-way is located in the forest wide direction on Special Uses. For examples, see FW-SpecUse-DC-1 and 2, FW-SpecUse-G-1, 2, 3, 5, 6, 7, 8, 9, and FW-SpecUse-Management Approaches.

Concern Statement #156: The Recreation Opportunity Spectrum (ROS) classifications on the Forest should buffer adjacent to road easements to accommodate maintenance and treatment of noxious and invasive plant species. (83-14)

Response: The process used to model ROS settings on the Forest applied a one-half mile buffer to "better than primitive" roads. "Better than primitive" roads include National Forest System roads with an operational maintenance level of 3, 4, or 5. State highways like State Route 260 fall into this category. The area within the buffer on these roads was given a classification of Roaded Natural. Some adjustments were made to this buffer in the East Clear Creek Watershed where only a 100-foot buffer of the Roaded Natural class was applied to the "better than primitive" roads. Beyond that 100-foot buffer, the areas were classified as Semi-primitive Non-motorized. This adjustment should not impact the one-half mile Roaded Natural buffer on State highways. Accordingly, the ROS settings for the Forest should not impact the ability of the Arizona Department of Transportation to conduct maintenance and treatment of noxious and invasive plant species within or adjacent to their highway easements. See the Coconino National Forest Recreation Opportunity Spectrum Inventory Report (USDA Forest Service 2016c) for additional information.

Concern Statement #238: The Forest Plan should include direction for power line and towers to be compatible with avian use, not just raptor use as suggested in the Special Uses desired conditions (see Draft Revised Plan FW-SpecUse-DC-3). The Forest Plan should also acknowledge the Suggested Practices for Avian Protection on Power Lines developed by the Avian Power Line Interaction Committee (APLIC). (43-13, 69-19, 82-23)

Response: The Forest Plan has been adjusted in response to these comments. The portion of FW-SpecUse-DC-3 from the Draft Revised Plan that addressed powerline compatibility with raptor use has been merged with similar direction in one of the Special Uses guidelines, which provides sideboards on the construction and reconstruction of powerlines and towers (see Draft Revised Plan FW-SpecUse-G-2). To provide for broader application, this merged component refers to "wildlife" instead of "raptor" or

"avian" use. See FW-SpecUse-G-5. A full reference to Avian Power Line Interaction Committee (APLIC) has been added to the Special Uses section in appendix D, Other Sources of Information. This reference is also located in the Wildlife, Fish, and Plant section in appendix D.

Concern Statement #240: The Forest Plan should include direction that manages the impacts that utility lines can have on scenery and recognizes the economic implications that can be associated with mitigations for scenery. (43-12, 69-18, 69-21, 74-88, 74-89, 74-92, 82-22)

Response: Several plan components have been modified to address these concerns. This desired condition in the forestwide Special Uses section that addresses the impacts of utility and energy transmission corridors on the Forest has been modified to address this concern and clarify its overall intent. Some commenters expressed concern with what appeared to be a general requirement to bury all infrastructure within these corridors, which can raise economic and environmental concerns. Other commenters expressed support for burying all infrastructure in these corridors and asked that vegetation clearing for these corridors be kept to a minimum. After considering all of these comments, the desired condition was adjusted to make it clear that its goal is for this type of infrastructure to not be visible across the landscape, rather than defaulting to burying it. The desired condition has also been modified to recognize that economic and technical concerns are appropriate factors (in addition to environmental and technical concerns) to consider when addressing the visibility of this type of infrastructure. See FW-SpecUse-DC-3.

The corresponding guideline in the Special Uses section that addresses burial of utility lines has also been modified to recognize that economic concerns are appropriate factors (in addition to environmental and technical concerns) to consider when addressing the visibility of this utility lines. See FW-SpecUse-G-9.

With regard to vegetation management, a Special Use desired condition was adjusted to acknowledge that there are legal mandates associated with the vegetation clearing for these corridors and it is a desired condition to meet those legal mandates. See FW-SpecUse-DC-2. While this desired condition recognizes that there is a level of vegetation clearing that is necessary for the safe operation of these corridors, it also recognizes the desire of moving toward other desired conditions applicable to the area. This includes the desired conditions for scenery. To support this desired condition, the forestwide Special Uses section has retained a guideline that requires the retention of vegetation that does not need to be cleared to meet legal mandates to allow screening for scenery, habitat for species, and corridors for wildlife movement. See FW-SpcUse-G-6.

Concerns about co-locating infrastructure in an existing corridor before a new corridor is considered were addressed in several plan components in the forestwide Special Uses and Scenery sections. To consolidate this direction in one plan component, the guideline in the forestwide Scenery section that was designed to prevent the widening of utility rights-of-way in areas that have a moderate scenic integrity objective was merged with a similar direction in the forestwide Special Uses section. See FW-SpecUse-G-8. Whether the additional infrastructure should be buried is addressed by the plan components discussed above.

Concern Statement #241: The Forest Plan should set the Scenic Integrity Objective for public utilities in the Sedona-Oak Creek area at no less than high. (74-100)

Response: The guideline that generated this comment has been removed from the Forest Plan. Desired scenic integrity objectives have already been set for the Forest. The process for identifying scenic integrity objectives took the ability to view an area from Concern Level 1 and 2 routes into consideration. However, the activities required for the development and operation of a public utility will not meet the definition of high scenic integrity, which relies upon the landscape character appearing natural or unaltered. For example, legal mandates require vegetation clearing within utility corridors. This type of vegetation management will not meet the requirements for high scenic integrity.

Concern Statement #243: The Forest Plan should include direction to ensure that the 200 to 800 miles of road to be decommissioned as part of the Roads and Facilities objective do not result in restricted access for utilities. Access to operate and maintain infrastructure and rights-of-way must be allowed to ensure the delivery of safe, reliable power. (69-17, 82-5)

Response: The Roads and Facilities objective does not make a decision to decommission any particular road on the Forest. Those decisions will be made based on site-specific proposals that involve coordination with stakeholders. However, the Forest Plan includes a desired condition for the transportation system (roads) to provide reasonable motorized access for permissible uses, such as access to infrastructure. See FW-RdsFac-DC-1.

The Roads and Facilities objective to decommission 200 to 800 miles of unauthorized and system roads has been adjusted to clarify that the roads to be decommissioned will not include any of the roads identified on the motor vehicle use map as open to the public. See FW-RdsFac-O-1. This objective is aligned with the ongoing travel management effort and is not a decision to create additional, new limitations to motorized use on the Forest. The desired condition discussed above will help ensure that roads that provide reasonable motorized access to infrastructure are maintained when decisions are made in the future to decommission specific unauthorized and system roads that are not identified on the motor vehicle use map as open to the public.

To address the concern about retaining access for utilities, a management approach has been added in the forestwide Roads and Facilities section, which reminds forest managers to:

> Work closely with utilities to ensure access to rights-of-way and infrastructure.

Concern Statement #277: The Forest Plan should recognize exceptions to scenery desired condition in utility rights-of-way in recognition of industry standards regarding vegetation management. (43-14, 82-24)

Response: This guideline has been adjusted to address the concerns in this comment. Recognizing that complete conformity with natural-appearing patterns of native vegetation is not always possible, the guideline now requires structures to be designed to reduce the contrast with desired landscape character in accordance with scenic integrity objectives. See FW-SpecUse-G-7.

Concern Statement #295: The Forest Plan should include language to address the issue of compatible uses within the transmission line corridors and the type of acceptable plant communities. For example, consider the following components from the Prescott National Forest's 2012 Draft Land and Resource Management Plan:

> **"Power lines and pipelines are located and co-located within existing energy corridors when compatible. Rights-of-way for all aboveground lines have low growing plant communities that do not interfere with overhead lines growing within the corridors." and/or**
>
> **"Low growing plant communities that do not interfere with overhead lines, should be maintained within power line corridors." (43-6)**

Response: A guideline was added to the Special Uses section to address this comment. See FW-SpecUse-G-6.

Concern Statement #297: The Forest Plan should not require permittees to manage vegetation outside of right-of-way corridors and should allow utility permittees to manage vegetation with utility corridors to industry standards. (43-15, 69-26, 82-25)

Response: No change has been made in response to the comment regarding vegetation management outside of rights-of-way. As the comments suggest, vegetation management of this nature would require a decision based on site-specific information and would not necessarily be the responsibility of the holder of the right-of-way.

The Forest Plan has been adjusted to address the comment regarding vegetation management within utility corridors. To provide more strategic and comprehensive coverage, one of the desired conditions in the Special Uses section was adjusted to acknowledge the legal mandates that apply to vegetation clearing for utility and energy transmission. See FW-SpecUse-DC-2.

Concern Statement #559: The Forest Plan should include direction for ranger districts to provide consistent management of utility rights-of-way that traverse more than one administrative jurisdiction. (43-5)

Response: A management approach has been added to the Special Uses section reminding forest managers that:

> When utility facilities traverse National Forest System lands administered by more than one ranger district within the Coconino NF, coordinate with utility companies in the development of regular operating plans to document agreements and activities along these corridors for consistent and seamless decisions where appropriate, that can be integrated along whole linear rights-of-way or utility corridors.

Concern Statement #560: The Forest Plan should recognize legal requirements to maintain vegetation clearances in utility corridors. (69-20, 82-6, 82-7)

Response: The concern related to vegetation management in utility rights-of-way is addressed in other plan direction in the Special Uses section. Vegetation clearing in utility corridors that meets legal mandates is a desired condition. See FW-SpecUse-DC-2. A guideline further clarifies that vegetation in utility corridors is only retained if it does not interfere with meeting vegetation clearing requirements for the corridor. See FW-SpecUse-G-6.

Concern Statement#564: The Forest Plan should not require an increase in power line capacity without allowing for an expansion of the right-of-way as directed by Scenery guideline FW-Scenery-G-9 in the Draft Forest Plan. (69-22)

Response: The Forest Plan has been adjusted in response to this comment. This Scenery guideline was merged with a similar Special Uses guideline (FW-SpecUse-G-4 in the Draft Revised Plan) which directs forest managers to consider using or expanding sites and corridors for existing utilities and areas adjacent to road rights-of-way before creating new sites or corridors. See FW-SpecUse-G-8.

Concern Statement #562: The Forest Plan should allow for the expansion or extension of existing utility lines that are within Environmental Study Areas. (69-25)

Response: No change has been made to the Forest Plan in response to this comment. In general, the Forest Plan promotes the use and expansion of existing utility corridors before creating new utility corridors (FW-SpecUse-G-8). However, with regard to Environmental Study Areas, the Forest Plan includes several guidelines that could restrict expansion or extension of utility lines to retain and protect the interpretive and educational opportunities and resources of the area. See MA-MtElden-G-5 and 6 and MA-FlagN-G-1 and 2. The actual determination would be made at the project level based on site-specific information.

Concern Statement #764: The Forest Service should ensure that any new land management decisions be made in the context of current land uses and not exclude authorized power transmission system. (43-2)

Response: Past authorizations for power transmission systems are outside the scope of the Forest Plan. Future projects and activities, including modifications or reauthorizations of existing uses, must be consistent with the Forest Plan in effect at the time of the decision and various laws, agency policy, and direction. See the Future Projects, Program Plans, and Assessments section in chapter 1 of the Forest Plan. The Forest Plan provides forestwide direction on forest resources (see chapter 2 of the Forest Plan).

Concern Statement #309: The Forest Plan desired condition in the Sedona-Oak Creek Management Area that addresses motorized tours (see Draft Revised PlanMA-SedOak-DC-25) should include direction to manage airplane and helicopters along with other motorized tours. (74-97)

Response: Specific references to airplanes and helicopters have not been added to this Sedona-Oak Creek Management Area desired condition as suggested. However, the general concerns about airplanes and helicopters are addressed in the broader, strategic language in several plan components.

Although the Forest has limited jurisdiction over airplanes and helicopters that are flying over the Forest, the Forest Plan contains a number of desired conditions that could be used to manage airplane or helicopter traffic related to Forest Service authorized tours. The All Recreation section has a desired condition for recreation opportunities to be balanced with the capacity of forest resources to support them and for recreation settings to be stable and retain their natural character. See FW-Rec-All-DC-6. Another All Recreation desired condition seeks to provide opportunities for experiencing solitude and natural soundscapes that are consistent with ROS objectives. See FW-Rec-All-DC-10. Special Use desired conditions also touch this topic by noting that recreation special use activities should not draw attention to the equipment and are consistent with site-specific direction for other forest resources and community goals. See FW-SpecUse-DC-7 and 8. Finally, a management approach has been added to the Designated Wilderness Areas section to remind forest managers to:

> Collaborate with Federal Aviation Administration, airport administrations, air tour operators, military and government agencies, and other aircraft operators to minimize disturbances caused by aircraft over designated Wilderness areas of the Coconino National Forest. Aircraft disturbances include, but are not limited to, diminishing solitude and primitive recreation opportunities and disruption to key wildlife areas during important times of their life cycle. Examples could include peregrine falcon nesting sites and big game wintering habitat. Encourage aircraft operators to adhere to Federal Aviation Administration's Notice to Airmen regarding minimum altitudes over wilderness.

Concern Statement #310: The Forest Plan should place more restrictions on motor vehicle use on the Forest and resist recognizing new types of motorized recreation. (56-157)

Response: The Forest Plan has been adjusted in response to this comment. The purpose of this management approach upon which the comment is based was to acknowledge that new types of recreational activities are emerging all the time and to remind forest managers to recognize them as legitimate recreational pursuits. This management approach has been removed from the Forest Plan and the concept of emerging recreational pursuits has been incorporated into the General Description and Background for All Recreation. A desired condition in the All Recreation section seeks to balance recreation opportunities with the capacity of forest resources to support them, to have minimal user and resource conflicts, and to retain recreation settings as the population increases and new forms of recreation emerge. See FW-Rec-All-DC-6.

Specific motorized use determinations are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule. The Forest Plan includes a standard requiring motor vehicle use to occur as defined on motor vehicle use maps (MVUM), except for those uses authorized by law, permits, and orders in connection with resource management and public safety. See FW-Rec-Disp-S-1 and FW-RdsFac-S-1.

Concern Statement #442: The Forest Plan should identify sites where mountain bike events are appropriate on the Forest. (72-8)

Response: Identifying sites for particular recreation events is not a plan-level decision. This is addressed at the project level on a case-by-case basis. The Forest Plan provides guidance for these project-level decisions. For example, the Special Uses section recognizes that sites for recreation events are part of the Forest's desired conditions. See FW-SpecUse-DC-9. The Forest Plan also includes an objective to approve at least four sites for recreation events and large group gatherings within 10 years of plan approval. See FW-SpecUse-O-1.

Concern Statement #363: The Forest Plan should be adjusted to ensure that a land exchange that technically meets the standard (see Draft Revised Plan MA-SedOak-S-7) would not result in a diminishment of the scenic integrity of the Sedona/Oak Creek area. (74-15)

Response: The standard has not been modified as suggested. While scenery is definitely an important resource in the Sedona-Oak Creek area, there are other qualities in the area that may be benefited by a land exchange. The forestwide guidelines on Land Adjustments provide the direction for what qualities acquired and exchanged lands should have. See FW-LndAdj-G-1 and 2. Scenic integrity is expressly listed as a quality the Forest takes into account when considering land acquisition. See FW-LndAdj-G-1.

Concern Statement #444: The desired condition addressing new outfitter-guide permits in the Sedona/Oak Creek Management Area in the Forest Plan (see Draft Revised Plan MA-SedOak-DC-24) should be adjusted to make it clear that they will only be authorized when there is demonstrated public need and that they promote transportation services and public safety. Furthermore, this plan component should state that "Any new permit should maintain or increase the protection of cultural and natural resources." (74-96)

Response: The plan component has been adjusted as suggested in the comment. See FW-SpecUse-G-16. Because the plan component was worded more in the form of a guideline (describing sideboards that guide management) and because this plan component addresses forestwide management concerns, it was slightly reworded and placed with the other guidelines in the Special Uses section.

Concern Statement #478: The Forest Plan should provide additional guidance for proposals that consider converting closed roads to trails. (56-17, 74-79, 84-47)

Response: The Forest Plan has been adjusted in response to this comment. The portion of this component that addressed converting closed roads to trails has been converted into a guideline in the Trails section. See FW-Rec-Trails-G-5. The guideline incorporates the suggestion to consider impacts to other resources when considering whether to convert a closed road to a trail. The guideline does not require the trail to be non-motorized. That decision would be made at the project level based on site-specific information. The Forest Plan includes a desired condition for the transportation system (roads) to provide reasonable motorized access for permissible uses, such as access to infrastructure or neighboring land. See FW-RdsFac-DC-1. This plan component also provides guidance on whether a road should be closed and/or converted to a trail.

Concern Statement #656: The Forest Plan should continue to authorize jeep tours. (641-1)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not decide whether existing jeep tours should continue. That decision is made when it is time to consider whether to renew the special use authorization.

Concern Statement #673: The Forest Service should adjust the authorized level of use by Red Rock Jeeps on the Soldier Pass Road. (93-1)

Response: This comment is outside the scope of the plan. The Forest Plan is programmatic in nature and does not identify specific changes in existing special use authorizations. Changes of this nature are made through special-use authorization administration or new project-level decisions.

Concern Statement #674: The Forest Service should provide the same management of commercial jeep traffic on Soldier Pass Trail as is applied to Broken Arrow Trail. (97-1)

Response: This comment is outside the scope of the plan. The Forest Plan is programmatic in nature and does not make decisions on how commercial jeep tours should be managed on specific trails. Changes of this nature are made through special use authorization administration or new project-level decisions.

Concern Statement #463: The Management Approach in the Land Adjustments section in the Forest Plan regarding consultation with local governments should be adjusted to clarify whether it addresses "land adjustments" or "land exchanges" or both. The Forest Service should also clarify what is meant by a "site-specific" land exchange. (74-82)

Response: The Forest Plan has been adjusted in response to this comment. The term "land exchange" has been replaced with term "land adjustment" in the management approach in the Land Adjustment section. It states:

> Consult with local governments about land adjustment proposals the Forest plans to take forward into the NEPA process. Public input on land adjustment begins at the time a site-specific land exchange is formally proposed and has met other land adjustment criteria and plan direction.

A site-specific proposal is a commonly understood concept that does not need further clarification in the Forest Plan. A site-specific proposal would involve a detailed explanation of who and what is involved, where the land parcels are, and when the adjustment is proposed to occur. This information would be used to develop a proposed action that would be shared with the public for scoping comments. Public comments on the proposed action would be used to develop alternatives if the comments could not be addressed directly in the proposed action. One alternative would involve taking no action on the proposal.

Concern Statement #604: The Forest Plan should define the term "land adjustment." The standards in the Sedona-Oak Creek management areas should been adjusted to use the broader term "land adjustment" instead of the narrower term "land exchange." (74-14)

Response: The Forest Plan has been adjusted in response to this comment. A definition for the term "land adjustment" has been added to the Glossary. The definition acknowledges that land adjustments are the acquisition or disposal of National Forest System lands through the following processes: sale, purchase, exchange, conveyance, rights-of-way, interchange, and grants.

The use of the term "land exchange" in the standards in the management areas that encompass the Sedona-Oak Creek area has been retained. See MA-RedRock-S-7, Ma-OakCrk-S-4, MA-SedN-S-4, and MA-HouseMtn-S-2. These standards were carried forward from the current plan for continuity of management on this topic.

Concern Statement #314: The Forest Plan should include more restrictive provisions on land exchanges and adjustment. For example, the Forest Plan should not include guidelines that express a willingness to dispose of land that has lost its wildland character or that is needed to meet the needs of communities and the public. See Draft Revised Plan FW- LndAdj-G-2. The Forest Plan seeks to retain land and scenic quality. (74-81)

Response: This guideline has been modified to address this concern. Use of the word "willing" in this guideline was not intended to convey a desire to dispose of lands with these qualities. Rather, the intent is for the Forest to consider these types of lands first IF a land adjustment is being considered. Listing lands that have lost their wildland characteristics in this guideline does not create an inevitability that those lands will leave forest ownership. This guideline simply tries to ensure that any National Forest System land that is being considered in a land adjustment has qualities that make its management as National Forest System land problematic and/or consider its other potential value to communities and the public. The guideline has been modified to clarify that intent. See FW-LndAdj-G-2.

For the purposes of this guideline, why a piece of land may have lost its wildland characteristics is irrelevant. An area that has lost its wildland characteristic would almost certainly not be meeting the desired conditions for the resources in that area. The plan components associated with those resources (for example, Soil, Watersheds and Water, Riparian Areas, Terrestrial ERUs, Wildlife, Fish, and Plants) would be applied to address losses in wildland characteristics. Listing lands that have lost their wildland characteristics in this guideline does not set aside all of the other plan components that may apply to such an area. Management action and authorized activities in these areas would need to be designed to ensure that these areas are meeting or moving toward desired conditions.

The Forest Plan does not include express direction to retain all National Forest System lands. Rather, the Forest Plan takes a strategic approach to this concern and identifies what qualities acquired and exchanged lands should have. See FW-LndAdj-G-1 and 2. Scenic integrity is expressly listed as a quality the Forest takes into account when considering land acquisition. See FW-LndAdj-G-1.

The concern about less restrictive language overriding more restrictive language is addressed in the Introduction for chapter 2. It notes that "in the event of conflicts with other sections of this plan, the more restrictive plan decision always applies."

Concern Statement #490: The Forest Plan should include a standard to pursue State Trust lands in the Walnut Canyon Management Area. (61-2)

Response: No change has been made to the Forest Plan in response to this comment; the topic is already addressed by several plan components. The forestwide Land Adjustments section in the Forest Plan includes several components that provide a management framework on this topic. A desired condition seeks a mostly contiguous land base, which could lead to efforts to bring inholdings such as the State Trust lands under management by the Forest. See FW-LndAdj-DC-1. A guideline lays out qualities that should be possessed by land to be acquired, including habitat for threatened and endangered species, existence of significant cultural resources, prevention of damages to resources, and/or improvement to management of designated special areas. See FW-LndAdj-G-1. Furthermore, a standard in the Walnut Canyon Management Area ensures that land adjustments in this management area will not result in a reduction of the National Forest System lands in this management area. See MA-Walnut-S-2.

Concern Statement #642: The Forest Plan should reference the Memorandum of Understanding (MOU) between several federal departments, providing for the coordination among federal agency reviews of electric transmission facilities. (82-8)

Response: The Forest Plan has been adjusted in response to this comment. The MOU regarding coordination in Federal agency review of electric transmission facilities on Federal land has been added to the Forest Plan in the Special Uses section in appendix D, Other Sources of Information.

Concern Statement #651: The Forest Service should consider all current land uses on the Forest, including electric power facilities, and develop an integrated management plan. (43-1)

Response: The Forest considered current land uses on the Forest, including electric power facilities, when developing the Forest Plan. This process included preparation of the Economic and Social Sustainability Assessment (2008), which considered the trends, risks, and effects on the management of special uses, such as power lines and rights of way. This information was summarized in the Analysis of the Management Situation (2010), which identified the needs for change with the 1987 forest plan. These needs for change guided the development of the proposed revised plan.

In addition to addressing the needs for change, the proposed revised plan uses a more strategic approach that generally avoids applying overly prescriptive direction. This approach allows the Forest Plan to guide decisions on activities and projects in a manner that ensures the Forest moves toward or maintains desired conditions without dismissing or unnecessarily constraining an activity or project without considering it at the project level where site-specific information can inform the decision.

Concern Statement #561: The Forest Plan should identify an additional communication site within the Arizona Snowbowl special use permit boundary. (90-4)

Response: The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. It does not contain project and activity decisions, such as permitting or prohibiting occupancy, use, or access. Decisions to authorize a communication site are made at the project level based on site-specific information.

Concern Statement #749: The Forest Service should create a process by which special use permits can be changed in the future, for example, if federally threatened and endangered species issues arise. (56-202, 64-50)

Response: The Forest Service has processes that allow for amendments to special use authorization when new issues arise. A standard clause in Forest Service special use authorizations states that the permit may be amended in whole or in part by the Forest Service when, at the discretion of the authorized officer, such action is deemed necessary or desirable to incorporate new terms that may be required by law, regulation, directive, the applicable forest land and resource management plan, or projects and activities implementing a land management plan pursuant to 36 CFR Part 214.

The Forest Service also has existing policy that addresses new information or changed conditions that might affect ongoing projects to determine if the environmental analysis and documentation for that project needs to be corrected, supplemented, or revised. See Forest Service Handbook 1909.15, 18.1 - Review and Documentation of New Information Received After Decision Has Been Made. This policy states that

> If new information or changed circumstances relating to the environmental impacts of a proposed action come to the attention of the responsible official after a decision has been made and prior to completion of the approved program or project, the responsible official should review the information carefully to determine its importance. Consideration should be given to whether or not the new information or changed circumstances are within the scope and range of effects considered in the original analysis.

Concern Statement #191: The Forest Plan should be adjusted so that the Special Uses guideline related to disturbance to raptor species (see Draft Revised Plan FW-SpecUse-G-20) applies flexible management rather than rigid timing restrictions. (70-3)

Response: This guideline was adjusted in response to the comment. The guideline was merged with several other plan components to create a more strategic guideline. The revised guideline can be found at FW-WFP-G-8. The revised guideline still requires timing restrictions to protect wildlife, such as peregrine falcons, but it leaves the identification of the exact dates of the timing restrictions to site-specific decisions, which can ensure that the right time frame is protected for the area and species involved without being unnecessarily restrictive to other activities.

A management approach was added to the Wildlife, Fish, and Plants section of the revised Plan to provide additional clarity for this guideline. It reminds forest managers that:

> The application of timing restrictions, like those referenced in FW-WFP-S-2 and FW-WFP-G-8, will be based on site-specific information and may vary depending on variables such as species, weather, timing of activity relative to species life cycle, or duration, frequency, and type of activities that are occurring in the species' habitat. Other variables to be considered could include the duration, extent, and intensity of the proposed activity, or the type of activity itself, such as emergency or safety-related actions versus non-emergency activities. The best available information and science is utilized to develop timing restrictions to reduce impacts to disturbance sensitive species.

Livestock Grazing

Concern Statement #98: The Forest Service should implement additional strategies and monitoring on livestock grazing to reduce impacts on water, soil, and vegetation resources. (56-23, 56-24, 84-38, 84-52, 84-53, 84-54, 84-55, 110-5)

Response: The Plan includes direction (FW-Graz-DC-2, FW-Graz-G-2, and FW-Rip-All-G-1) that will guide livestock grazing to meet or move toward desired conditions. Those desired conditions include stable or restored stream channels (FW-Rip-Strm-DC-1), the filtering of runoff (FW-Rip-Strm-DC-3), the reduction of damage from floods (FW-Rip-Strm-DC-1), and the enhancement of habitat by controlling water temperatures and providing shelter to wildlife (FW-WFP-DC-4). For example, requiring a specified buffer around certain resources may be too small, too big, or unnecessary altogether to meet those desired conditions. The appropriate grazing management necessary to meet or move toward these desired conditions will be determined and monitored at the project level based on site-specific information. In addition, projects and activities in perennial and intermittent streamcourses and in all riparian areas should be designed and implemented to retain or restore native vegetation, and riparian and soil function (FW-Rip-Strm-G-1), and managed to maintain ecological functions and maintain habitat and corridors for species (FW-Soil-DC-2, FW-Soil-G-2, 3, FW-Rip-All-G-2, FW-Rip-RipType-DC-3, 4, and FW-Rip-RipType-G-3).

Concern Statement #99: The Forest Plan should not allow livestock use or livestock waste within riparian areas and streambanks should be protected by herbaceous, riparian vegetation. (56-60)

Response: Although the Forest Plan does not prohibit livestock from using riparian areas, a number of plan components would maintain and protect riparian composition, structure, and function. For example, the intent of a riparian guideline has been clarified and the guideline has been moved to the Livestock Grazing section because it only applies to grazing management. See FW-Graz-G-7. Plan components that support riparian desired conditions include: FW-Graz-G-4, 5, FW-Rip-All-DC-5; FW-Rip-Strm-G-1; FW-Rip-Spr-G-3; and FW-Rip-RipType-G-3.

Concern Statement #100: The Forest Service should eliminate herbivory by non-native species at seeps, springs, and seasonal wetlands within 5 years. (64-47)

Response: The Forest Plan does not explicitly exclude springs, which includes seeps, and seasonal wetlands, from non-native herbivory; however, no grazing is an option based on site-specific analysis. Use of springs and wetlands is also influenced by existing water rights. Chapter 4 of the plan, Grazing Suitability, shows that 82,322 acres are closed to grazing as a result of signed decisions. Some of these areas include springs and wetlands.

Permitted livestock grazing is intended to be consistent with the desired conditions of other resources; however, the Forest Plan acknowledges that there may be lower levels of vegetation and higher levels of soil compaction immediately adjacent to earthen stock ponds and developed springs where livestock concentrate. See FW-Graz-DC-2, FW-Graz-DC-G-2. There are specific desired conditions in the section for Wetlands that promote functional soil and water resources, diverse habitats for native species, maintenance of riparian soil moisture characteristics, a variety of age classes, and a native species composition that reflects the individual wetland types, such as seasonal wetlands. See FW-Rip-Wtlnds-DC-1 and 2. Also, the Springs section describes specific desired conditions for vegetation, soil, and riparian function. See FW-Rip-Spr-DC-1, 2, 3. There is a guideline that requires activities be designed and implemented to maintain or improve soil and riparian function, maintain or improve native vegetation and design features could include livestock management. See FW-Rip-Spr-G-3. In addition, there are objectives to restore 5 to 10 wetlands currently not in proper functioning condition so that they are in, or are trending toward, proper functioning condition during each 10-year period over the life of the plan and an objective to restore riparian function to at least 25 springs identified as not in proper functioning conditions during each 10-year period during the life of the plan. See FW-Rip-Wtlnds-O-1 and FW-Rip-Spr-O-1. Finally, there is a guideline in the section of Wildlife, Fish and Plants that requires management activities to be designed and implemented to protect and provide for narrowly endemic species and species with restricted distributions (many of which occur in springs). See FW-WFP-G-10.

The Livestock Grazing section has specific guidance to protect springs, seasonal wetlands, and other riparian areas such as locating and using structural range improvements and salt, minerals, and/or other supplements in a manner that is consistent with desired conditions for other resources and so that riparian areas and wet meadows are protected. See FW-Graz-G-4 and 5. See also FW-Rip-All-G-1. There is a specific guideline in Livestock Grazing for when permitted livestock have access to riparian areas, the use on riparian species should provide for maintenance of those species, allow for regeneration of new individuals, protect bank and soil stability, and reduce the effects of flooding. Maintenance of woody riparian species should lead to diverse age classes of woody riparian species where potential for native woody vegetation exists. This guideline would not apply to fine-scale activities and facilities such as intermittent livestock crossing locations, water gaps, or other infrastructure used to minimize impacts to riparian areas at a larger scale. See FW-Graz-G-7.

Concern Statement #115: The Forest Service should conduct a grazing capability and suitability analysis for this plan revision effort in compliance with the National Forest Management Act. (56-122, 56-123- 56-124, 56-128, 64-8, 64-12, 64-17, 64-18, 64-21, 64-22, 81-6, 84-5, 84-6, 84-7, 84-11)

Response: The Forest has conducted a grazing capability and suitability analysis for this plan revision effort in compliance with the National Forest Management Act. Capability is the potential of an area of land to produce resources and supply goods and services. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils, and geology. These have not changed significantly since the evaluation was done for the 1987 plan. Suitability is the appropriateness of applying certain resource management practices to a particular area of land in consideration of the relevant social, economic, and ecological factors. A unit of land may be suitable for a variety of individual or combined

management practices. Identifying lands as suitable for livestock grazing indicates that grazing is compatible with the desired conditions and objectives in the plan area.

In forest planning, Section 219.20 of the 1982 planning regulations requires a determination of the lands potentially capable and suitable for livestock grazing. To make this determination, the Forest started with the total acres on the Coconino NF and removed 452,367 acres of lands not potentially capable for livestock grazing. The process for identifying the lands not potentially capable for livestock grazing is described above in the section titled Determination of Lands Capable for Livestock Grazing in the Livestock Grazing section in appendix C of the Final Environmental Impact Statement. This revealed that 1,390,598 acres on the Coconino NF are Lands Potentially Capable for Livestock Grazing.

Next, the Forest removed 82,322 acres of lands that were not suitable for livestock grazing that had been identified as potentially capable. Suitability is the appropriateness of applying certain resource management practices to a particular area of land in consideration of the relevant social, economic, and ecological factors. The process for identifying the lands not suitable for livestock grazing is described in the section titled Determination of Lands Suitable for Livestock Grazing in the Livestock Grazing section in appendix C of the Final Environmental Impact Statement. Some of the acres identified as not suitable had also been identified as not potentially capable. Approximately 152,934 acres of not suitable land had already been removed because they were not potentially capable, and therefore, were not part of the Lands Potentially Capable for Livestock Grazing. To avoid double counting these acres, the total lands determined to be currently not suitable were reduced by 152,934 acres.

After the lands not potentially capable and not suitable have been removed from the total acres on the Coconino NF, the remaining land is potentially capable and suitable for livestock grazing. Through this process, the Forest determined that there are 1,308,276 acres on the Forest that are potentially capable and suitable for livestock grazing.

The identification of lands suitable for livestock grazing within the Forest Plan is not a decision to authorize livestock grazing. The final decision to authorize livestock grazing would be made at a project (individual grazing allotment) level. On a site-specific basis, grazing allotments are guided by an adaptive management strategy whereby results from long- and short-term monitoring are used to determine yearly stocking rates, pasture rotations, and whether other adjustments are needed to meet management objectives and desired conditions for rangelands.

Concern Statement #154: The Forest Plan should require collaboration with grazing permittees at early stages of projects and ongoing dialogues with grazing permittees. (44-13)

Response: The Forest Plan has been adjusted in response to this comment. A management approach has been added to the Livestock Grazing section, which reminds forest managers to:

> Collaborate and communicate with permittees to facilitate ecologically and economically sustainable rangeland management, livestock grazing practices, and ecosystem goods and services.

Concern Statement #228: Livestock grazing should be removed where juniper encroachment is problematic. (56-52)

Response: Specific direction to remove livestock grazing from areas where juniper encroachment has not been added to the Forest Plan. Juniper encroachment in grasslands is primarily due to historic fire suppression. To the extent that livestock grazing management would be beneficial in addressing juniper encroachment, this would be addressed during site-specific allotment analysis.

However, this concern is still addressed by other plan components. A guideline in the Forest Plan requires livestock grazing to be managed to meet, or move toward, the desired conditions for forest resources such as soil, water, vegetation, and species. See FW-Graz-G-2. The Grassland Ecological Response Units section includes a desired condition that describes the desired plant composition in grasslands. See FW-TerrERU-Grass-DC-1. These plan components will guide decisions on livestock grazing in grasslands.

Concern Statement #229: The Forest Plan should include direction to protect aspen from the impacts of livestock grazing. (56-127, 84-10)

Response: Specific direction to exclude livestock grazing from aspen has not been added to the Forest Plan. Although the requested changes have not been made, the concern expressed regarding the potential impacts of livestock grazing on aspen is still addressed by other Forest Plan components. A guideline in the Forest Plan requires livestock grazing to be managed to meet, or move toward, the desired conditions for forest resources such as soil, water, vegetation, and species. Also, structural range improvements (fences, earthen stock ponds, etc.) should be located, constructed, reconstructed, maintained, and used in a manner consistent with desired conditions for sensitive resources, including aspen, and salt and/or other supplements should be used and located so sensitive resources are protected from grazing related impacts. See FW-Graz-G-2, 4, and 5. The Aspen and Maple section includes several desired conditions for aspen. See FW-TerrERU-AspMpl-DC-1, 2, and 3. These plan components will guide decisions on livestock grazing in aspen.

Suitability is discussed in chapter 4 of the plan and appendix C of the Final Environmental Impact Statement. Aspen could be determined to be unsuitable through future site-specific decisions, but was not determined to be unsuitable in this process. For additional information on grazing suitability, see the response to comment suggesting that the Forest Service conduct a grazing capability and suitability analysis in compliance with the National Forest Management Act (Concern Statement #115).

Concern Statement #233: The Forest Plan should prohibit domestic livestock grazing on the Forest. (1278-2)

Response: Prohibiting livestock grazing is an alternative that was not carried forward for detailed consideration because existing agency policy is used to determine permitted levels of livestock grazing on the Forest. See "Prohibition or limitation on livestock grazing" in the Alternatives Eliminated from Detailed Study section in chapter 2 of the Final Environmental Impact Statement for additional information.

Concern Statement #234: The Forest Plan should recognize that wildlife herbivory can impact an area that has been burned or mechanically treated. Furthermore, the Forest Plan should also ensure that a small treatment in a large pasture does not always result in making the entire pasture unavailable for livestock grazing. (44-12)

Response: No adjustment was made to this guideline in response to this comment. Wildlife herbivory can impact recovery of an area after it has been treated. Grazing is managed to meet or move toward desired conditions for forest resources. See FW-Graz-G-2. Decisions on how to manage grazing will need to take the impacts of wildlife herbivory into account.

Likewise, treatment in a portion of a pasture may impact the management of the entire pasture. Determinations on the use of a pasture after a treatment has occurred will be made based on the site-specific circumstances of the treatment and the pasture.

Concern Statement #235: The Forest Plan should include a standard that requires desired conditions and management alternatives for grazing management projects to be co-developed by forest personnel and permittees. (44-11)

Response: No change was made in response to this comment. A standard requiring cooperative development of desired conditions and management alternatives would be redundant of existing regulations and policy, which require similar coordination through the normal scoping process for a project. See 40 CFR 1501.1, 36 CFR 220.4(e)(2), and FSH 1909.15, 11.

Concern Statement #373: The Forest Plan should require analysis of existing conditions for soil, watershed, vegetation, and riparian areas in individual grazing allotment analyses. (81-7)

Response: No change has been made in response to this comment. Consideration of existing conditions and comparison of those conditions with desired conditions is an integral part of every decision the Forest Service makes. This process is how the Purpose and Need, the proposed action, and alternatives are developed for every project or authorized activity. This process is already governed by the National Environmental Policy Act and Forest Service regulations and policy.

Concern Statement #382: The Forest Plan's objective to have five to seven priority watersheds that are not in Class I condition to be trending toward Class I condition (see Draft Revised Plan FW-WtrShd-Obj-1) does not reference climate change or the management of grazers. (56-12, 87-5)

Response: No change has been made to this objective in response to this comment. The intent of the objective is to seek to improve conditions in priority 6 watersheds, not to address possible factors that could be impacting the watersheds. This ensures that the most important watersheds receive attention over the life of the plan regardless of the reasons for their impairment. Moving watersheds toward desired condition is one way the Forest is addressing climate change. Watersheds in desired condition should be more resilient to the anticipated effects of climate change.

The management of permitted livestock grazing is generally discussed in the Livestock Grazing section. Plan components in that section include a desired condition for permitted livestock grazing to be consistent with the desired conditions for other resources (which would include Watershed) and a guideline to manage to meet, or move toward, the desired conditions for forest resources such as soil, water, vegetation, and species. See FW-Graz-DC-2 and FW-Graz-G-2. How domestic livestock grazing will be conducted in any particular area will be based on site-specific information and analysis. Grazing is also addressed in FW-TerrERU-Grass-G-2.

The Plan addresses other grazers in the Wildlife, Fish, and Plants section, which includes a desired condition for forest activities to support sustainable populations of native plant and animal species distributed throughout their potential natural range. See FW-WFP-DC-1. This section also includes a management approach regarding coordination with the Arizona Game and Fish Department to manage wildlife populations for the maintenance and improvement of elements of watershed condition. It states:

> Coordinate with the Arizona Game and Fish Department regarding the State Wildlife Action Plan as well as hunting recommendations for various wildlife populations that would lead to maintenance and improvement of habitat elements such as vegetation, aspen, riparian, and soil condition and productivity.

Concern Statement #425: The Forest Plan should specifically list karst features as an example of the sensitive features being referenced in the Livestock Grazing guidelines. (80-20)

Response: The guideline has not been adjusted to specifically list "karst features" as suggested by the comment. See FW-Graz-G-5. However, karst features could be recognized as a sensitive feature for the purposes of this guideline.

Karst features are more comprehensively addressed in the Geological Features section. Desired conditions in that section seek to maintain natural conditions and reduce disturbance related to human activities. See FW-BioPhys-Geo-DC-1. A desired condition for karst features promotes karst landscapes and cave formations that continue to develop or erode under natural conditions. See FW-BioPhys-Geo-DC-2. Guidelines ensure that livestock grazing and other projects and activities are designed and managed to maintain the integrity and function of karst features and to prevent siltation into sinkholes and cave entrances. See FW-BioPhys-Geo-G-1 and 2. The Livestock Grazing section also includes a guideline directing livestock grazing to be managed to meet, or move toward, the desired conditions for other forest resources. See FW-Graz-G-2.

Concern Statement #426: The Forest Plan should authorize the voluntary, permanent retirement of grazing allotments by permittees for conservation purposes. (56-129, 64-48, 84-12)

Response: This is outside the scope of the Forest Plan. Management and administration of grazing permits is already addressed by existing regulation and policy. The authority to permanently retire an allotment from grazing is retained by the Forest Service and is not held by the permittee.

Concern Statement #479: The Forest Plan should include more management direction related to livestock grazing. The former Plan required monitoring surveys in its standards and guidelines section, and required annual allotment inspections. It also required the Forest Service to "maintain or enhance condition classes" and to inventory riparian areas and unsatisfactory soils. (81-1)

Response: The Forest Plan is designed to be strategic and provide a framework for project-level decisions. In general, the Livestock Grazing section only includes direction that is specifically related to livestock grazing and does not duplicate law, regulation, and policy. This should not be interpreted to mean that the Forest Plan offers little guidance related to livestock grazing. As discussed in the Future Projects, Program Plans, and Assessments section in chapter 1 of the Forest Plan, all management activities must be implemented to be consistent with the Forest Plan.

Accordingly, when a decision to authorize grazing is made, it will need to be consistent with the plan components related to other resources and activities as well as the plan components in the Livestock Grazing section. Determining how to manage grazing in a particular area is a project-level decision that is guided by Forest Plan direction and site-specific information.

The Livestock Grazing section in appendix D, Other Sources of Information, has been updated with references to Forest Service Handbook direction. Monitoring would be addressed in FSH 2209.13 Chapter 90.

The term Condition Class was used in the 1987 Forest Plan and referred to condition classes ranging from excellent to very poor. These classes were a subjective expression by the Forest Service of the status or health of vegetation and soil relative to combined potential to produce a sound and stable biotic community (page 66-1 in the current plan). This term is no longer in use in the Forest Service and project-level analysis has been replaced with a more comprehensive approach to describing existing conditions, potential conditions, and desired conditions. This could vary by analysis and could include a combined description of the vegetative, wildlife, fuels, and soil resources, which collectively would inform the existing condition. Riparian condition and unsatisfactory soil conditions would be one aspect of existing condition in a livestock grazing analysis. See Exhibit 1B in FSH 2209.13 Chapter 90.

Several forestwide plan components in the Soil section deal with unsatisfactory soil. Desired conditions describe vegetative ground cover and properly functioning soil. See FW-Soil-DC-1 and 2. Soil objectives would focus on maintaining satisfactory soil conditions and/or improve impaired soil conditions. See FW-Soil-O-1. Soil guidelines would avoid or minimize soil impacts on particularly sensitive soils or on projects that could have long-term impacts to soil function and productivity. See FW-Soil-G-2 and 3.

Concern Statement #549: The Forest Plan should include direction for collaboration and coordination with grazing permittees to facilitate ecologically and economically sustainable production of ecosystem goods and services. (44-10)

Response: The Forest Plan has been adjusted in response to this comment. A management approach has been added to the Livestock Grazing section that reminds forest managers to:

> Collaborate and communicate with permittees to facilitate ecologically and economically sustainable rangeland management, livestock grazing practices, and ecosystem goods and services.

Concern Statement #550: The Forest Plan should include direction that recognizes the need for motorized travel off the designated road system to conduct livestock grazing management activities. (58-12)

Response: The Forest Plan has been adjusted in response to this comment. A management approach has been added to the Livestock Grazing section that reminds forest managers:

> When developing Annual Operating Instructions for grazing permit holders, consider the need for motorized travel off the designated road system and off-road to carry out required management practices necessary to comply with the terms and conditions of the Term Grazing Permit. Examples of required management practices include, but are not limited to: the repair and maintenance of structural range improvements; transport and placement of mineral or protein supplement; and tending to sick or injured animals.

Concern Statement #551: The Forest Plan should clarify the desired condition to have rangelands provide large areas of unfragmented open space. (81-8)

Response: This statement has been removed from the Livestock Grazing section because the concept of fragmentation and open space is not limited to grazing management. For example, the Forest Plan includes a desired condition for a mostly contiguous land base where open space values are retained. See FW-LndAdj-DC-1. Fragmentation and connectivity of aquatic, riparian, and riparian resources are also addressed in the Forest Plan. For examples, see FW-Rip-All-DC-3 and FW-TerrERU-Grass-DC-3.

Concern Statement #552: The Forest Plan should acknowledge that livestock grazing began in this area in the 1870s, before the Coconino NF was established. (58-10)

Response: The General Description and Background for the Livestock Grazing section has been adjusted in response to this comment. The information in that section has been changed to acknowledge that grazing commenced in this area in the 1870s, and that the Coconino NF began managing livestock on the Forest in 1908.

Concern Statement #553: The Forest Plan should include additional detail in Livestock Grazing standard on escape devices. (85-38)

Response: The Forest Plan has been adjusted in response to this comment. The requested detail has been added as a management approach in the Livestock Grazing section, which reminds forest managers:

When selecting and installing escape devices, consider devices made of long-lasting and grip-able materials that can be firmly attached to and meet the sides of the water development, and extend down to the bottom or lowest expected water level.

Concern Statement #638: The Forest Service should develop alternatives that apply at least 25 percent and 50 percent reductions in domestic livestock grazing to protect the habitat of native species. (64-7, 64-11)

Response: Prohibiting livestock grazing is an alternative that was not carried forward for detailed consideration because existing agency policy is used to determine permitted levels of livestock grazing on the Forest. See "Prohibition or limitation on livestock grazing" in the Alternatives Eliminated from Detailed Study section in chapter 2 of the Final Environmental Impact Statement for additional information.

Concern Statement #678: The Forest Service should analyze the effects of the foreseeable range improvements to the environment, propose standards and guidelines to limit their impact, quantify the financial cost to taxpayers that may result, and specify any source of appropriated funds that the Forest Service intends to use to pay for them. (56-125, 84-8)

Response: The effects of range developments upon the environment and measures to reduce the potential effects are addressed individually at the project-level environmental analysis. The costs of those developments and sources of funding would also be determined at the project level. There are often multiple opportunities to fund range structural developments through other Federal programs or wildlife groups such as the Arizona Elk Society, Rocky Mountain Elk Foundation, Mule Deer Foundation, etc. The quantification of financial costs to taxpayers and specification of funding sources to pay for them is beyond the scope of the Forest Plan and plan revision process.

The Livestock Grazing section expresses a desire for permitted livestock grazing to be consistent with the desired conditions of other resources. See FW-Graz-DC-2. This desired condition recognizes that conditions immediately adjacent to livestock concentration areas, such as earthen stock ponds, developed springs, and other features that concentrate livestock, may be inconsistent with general desired conditions for vegetation and soil such as lower levels of vegetation and higher levels of soil compaction. A guideline in the Livestock Grazing section requires structural range improvements to be located, constructed, reconstructed, maintained, and used in a manner that is consistent with the desired conditions for sensitive resources, such as riparian areas and formally identified archaeological sites. See FW-Graz-G-4.

Concern Statement #680: The Forest Service should not use scientific information from ecosystems not found on the Coconino NF to develop livestock grazing management on ecosystems on the Coconino NF. (64-10)

Response: The Forest Plan is designed to be strategic and provide a framework for project-level decisions. Determining how to manage grazing in a particular area is a project-level decision that is guided by Forest Plan direction and site-specific information. Scientific information should be used during site-specific analysis. It would be up to the specialist to consider and appropriately apply this information.

Concern Statement #689: The Forest Service should identify scientific studies that clearly demonstrate that herbivory by non-native species at any level during prolonged periods of drought is not deleterious to native systems and species - both plant and animal. (64-23)

Response: None of the alternatives authorize domestic livestock grazing, during times of drought or otherwise; therefore, including scientific studies that demonstrate that grazing under these conditions is

not deleterious to native systems and species is irrelevant. Decisions to authorize domestic livestock grazing are made at the project level based on site-specific information. Prolonged periods of drought can be considered in the decision to authorize grazing and are taken into account during the implementation of those decisions.

Elk are not considered a non-native species by the Coconino NF, the Arizona Department of Game and Fish, or the U.S. Fish and Wildlife Service. Each year the Coconino NF provides the Arizona Game and Fish Department input on elk hunt recommendations based on precipitation, plant growth, and vegetation impacts expected and from the previous year; however, management of elk populations is outside of the mission of the Forest Service.

Concern Statement #706: The Forest Service should provide more information on livestock grazing in relation to the Needs for Change discussed in chapter 1 of the environmental impact statement. It is insufficient to simply state that "grazing may negatively impact the values for which natural areas were designated." The Forest Service should provide more information in this section on topics such as the current history of grazing on the Forest, the number of appeals that have been filed on Allotment Management Plan decision, previous Freedom of Information Act requests on livestock related matters, and scoping comments on the draft revised plan. (64-5)

Response: No change has been made to the environmental impact statement in response to this comment. The statement the commenter takes issue with is not in the Needs for Change section in chapter 1 of the environmental impact statement; it is in the Issues section. The Issues section includes a list of comments the Forest received on the proposed revised plan. These comments are used to develop alternatives to the proposed revised plan. In this particular instance, the concern that grazing may negatively impact the values for which research natural areas were established was addressed by creating a plan component in alternative C that specifically addresses the concern. Specifically, alternative C includes a guideline that would replace SA-RNABotGeo-G-4 that is part of the proposed revised plan. It states:

> Livestock grazing should be excluded from research natural areas unless grazing supports or would not affect the area's research purpose.

A summary of the history of livestock grazing on the Forest and current grazing levels is included in the Livestock Grazing section in chapter 3 of the environmental impact statement. Additional relevant information is available in appendix C of the environmental impact statement, the Rangeland Specialist Report (USDA Forest Service 2015a), the Analysis of the Management Situation (USDA Forest Service 2010a), the Ecological Sustainability Report, and the Economic and Social Sustainability Assessment (USDA Forest Service 2008a). The information in the environmental impact statement is intended to be a summary and synthesis of the more detailed information found in these foundational documents. Past decisions are outside the scope of the plan. The effects of existing authorizations for domestic livestock grazing were analyzed in the decisions to authorize domestic livestock grazing.

Scoping comments on the draft revised plan are summarized in the Issues section in chapter 1 of the environmental impact statement. Additional information on the scoping process and the actual scoping comments are included in the project record.

Concern Statement #707: The Forest Service should consider the impacts of domestic livestock use on vegetation, water, and wildlife habitat. (64-9)

Response: The potential impacts of past and present livestock grazing are described in chapter 3 of the environmental impact statement in the Aquatic Systems, Riparian Resources, Soil, Vegetation and Fire, Wildlife, Fish, and Plants, Scenic Resources, and Livestock Grazing sections. Since the plan does not include project and activity decisions, there are no direct impacts associated with livestock grazing to be identified. Analysis of site-specific impacts would be completed later during the National Environmental

Policy Act (NEPA) process, after specific proposals are made and there is additional opportunity for public involvement.

The Forest Plan includes direction that will guide decisions on whether to authorize livestock grazing and, if so, under what conditions. For example, the Livestock Grazing section includes a desired condition and a guideline that will ensure that permitted livestock grazing is consistent with the desired conditions of other resources. See FW-Graz-DC-2 and FW-Graz-G-2.

Concern Statement #725: The Forest Service should analyze the economic impact of domestic livestock grazing including the cost to administer the livestock program. (56-126, 64-13, 64-14, 84-9)

Response: The Socioeconomic Analysis section in chapter 3 of the environmental impact statement provides a financial efficiency analysis for all alternatives. The values reported in the Range portion of this analysis takes into account the livestock grazing program area. It compares Forest expenditures and revenues throughout the life of the plan. The financial efficiency analysis indicates that the estimated annual Coconino NF program expenditures for the Range Program is projected to be $588,091 under all alternatives, while the estimated annual revenue for the Range Program is projected to be $180,797.

However, as the Socioeconomic Analysis section demonstrates, the economics associated with livestock grazing is more complicated than comparing forest expenditures and revenues. Simply considering expenditures and revenues does not give an accurate portrait of local economic consequences. Based on current actual utilization (91,394 head months), the domestic livestock grazing on the Coconino NF supports 236 jobs and $3.8 million in labor income. Using labor income as a measure helps provide a more accurate estimate of the local economic consequences of Forest Service management activities, because it considers what share of the expenditures cycle through the local area.

Grazing fees on public lands are determined using a formula established by Congress in the Public Rangelands Improvement Act of 1978, and has continued under a presidential Executive Order issued in 1986.

Concern Statement #756: The Forest Service should analyze the effects of domestic livestock grazing on species viability and habitat. (84-13)

Response: The environmental impact statement analyzes the potential impacts of domestic livestock grazing on species viability and habitat in the Wildlife, Fish, and Plants section in chapter 3.

In evaluating species viability, a coarse filter/fine filter approach was used. Each evaluated species was associated with its primary habitat (the coarse filter), which could be an Ecological Response Unit or riparian area. Primary threats, or Risk Factors, to the habitat were identified. Threats to the habitat constitute a threat to the species. Fine filter species-specific threats (such as disease) were also identified. This coarse filter/fine filter process was used to help develop and refine desired conditions, standards, and guidelines for the revised plan. Where appropriate, domestic livestock grazing was listed as a threat. For example, see the fine filter Risk Factors for Arizona cliffrose in the Desert Communities Ecological Response Unit section or the coarse filter Risk Factors for Wetlands in chapter 3 of the environmental impact statement.

Species-specific plan direction was developed where needed for threats the Forest Service could impact through management and for which the Forest Service has jurisdictional control. These plan components are listed in tables included in the analysis on the coarse or fine filters in the environmental impact statement. For example, the analysis on the threats to the Arizona cliffrose in chapter 3 of the environmental impact statement includes a table that lists the Forest Plan components that would protect Arizona cliffrose at the fine filter level. The environmental impact statement also discusses how these

plan components would provide protection for the plant community and soil components required by the Arizona cliffrose and its associated plant community. Management approaches were generally developed to address threats for which the Forest Service does not have complete jurisdiction.

In this manner, the Forest Service has analyzed the potential impacts of domestic livestock grazing on species viability and habitat and met the requirements of the National Environmental Policy Act and the National Forest Management Act.

Concern Statement #765: The Forest Service should consider the impact of forage consumption by domestic livestock and elk on native grazing animals, such as pronghorn, and an area's ability to support natural fire. (64-15, 64-16)

Response: The Forest Plan does not authorize grazing on the Coconino NF or specify the actual amount of livestock grazing (stocking) that could occur on the Forest. Those decisions are made at the project level based on site-specific information. The Forest Plan guides those decisions with a desired condition and guideline that require livestock grazing to be managed to be consistent with the desired conditions for other resources. See FW-Graz-DC-2 and FW-Graz-G-2. To be consistent with a desired condition in the Wildlife, Fish, and Plants section and the aforementioned Livestock Grazing components, projects proposing to authorize livestock grazing will need to consider the projected levels for forage consumption and the levels of forage necessary to provide the necessary physical and biological habitat components for carrying out growth, reproduction, survival, dispersal, and other key life cycle needs of associated native species. See FW-WFP-DC-3. Desired conditions for vegetation seek for fire to serve as a part of the natural disturbance regime. See-FW-TerrERU-All-DC-2, FW-TerrERU-Grass-DC-2 (but see FW-TerrERU-Grass-G-1), FW-TerrERU-IC-DC-3, FW-TerrERU-PJ-DC-3, 8, and 13, FW-TerrERU-AspMpl-DC-2, FW-TerrERU-PP-DC-3, FW-TerrERU-MC-MCFF-DC-5, FW-TerrERU-MC-MCIF-DC-4, and FW-TerrERU-SF-DC-5.

Grazing is authorized through term grazing permits (a long-term authorization subject to forestwide standards and guidelines) and payment of the annual Bill for Collection. Annual authorized livestock numbers can be reduced or adjusted in response to any site-specific resources conditions within any grazing allotment. Changes to these permitted livestock numbers would generally be made through project-level analyses.

Concern Statement #771: The Forest Service should provide information on how successful the current Forest Plan was in guiding livestock management to achieve desired conditions. (81-4)

Response: As part of the forest plan revision effort, the Forest considered what current guidance is working, what new conditions need to be addressed, and what ongoing challenges could be better addressed. Through this process, the Forest identified needs for change to the 1987 Forest Plan. This preparatory work is documented in the Analysis of the Management Situation, which was completed in May 2010 (USDA Forest Service 2010a). Chapter 1 of the environmental impact statement includes a Needs for Change section that summarizes that effort.

The Analysis of the Management Situation highlights the social, economic, and ecological conditions and trends in and around the Coconino NF, as detailed in the Forest's Economic and Social Sustainability Assessment (USDA Forest Service 2008a), the Ecological Sustainability Report (USDA Forest Service 2009a), as well as the Recreation, Grazing, Minerals, and Timber Demand report (USDA Forest Service 2010b) for the Forest. The Ecological Sustainability Report contains information on reference conditions, current conditions, and projected future condition and trend for various resources. This document also indicates when current or historic grazing may be impacting the current condition of a resource. In general, current grazing management under improved grazing strategies is credited as a factor for improvements in overall condition and positive trends in the future. These findings indicate that livestock

grazing management under the 1987 Forest Plan has generally been successful in achieving or improving trends toward desired conditions. The Analysis of the Management Situation uses these key findings, along with public input, to identify areas in the current Forest Plan direction that do not provide adequate guidance for the present and the future, and attempts to consider potential implications of those Forest Plan needs for change to other resources. Based on a review of the Analysis of the Management Situation, the Forest leadership team identified three priority themes to focus the scope of this plan revision effort: Recreation, Community-Forest Interaction, and Maintenance and Improvement of Ecosystem Health.

Through this effort, the Forest has considered at a programmatic level how successful the 1987 Forest Plan was in guiding livestock grazing management to achieve desired conditions.

Management Areas

Concern Statement #475: The Forest Plan should have more levels of information and direction for the management areas. (75-129)

Response: Several changes have been made to the Forest Plan in response to this comment. The General Description and Background sections for each management area have been edited to have a similar format and to have similar levels of detail. For example, a characteristics section has been added that provides a sketch of the resources and things that can be found in each management area. The plan was also reviewed to identify management area-specific direction that was located in the forestwide and special areas sections of the Forest Plan. When appropriate, this direction was moved to the appropriate management area. For example, a Dispersed Recreation standard relating to the Nordic Ski Center Seasonal Closure Area was moved to the San Francisco Peaks Management Area because the standard only applies in that management area. See MA-Peaks-S-2.

Concern Statement #12: The Forest Service should change the shape of the Walnut Canyon Management Area to match the Walnut Canyon Study Area and consider the area for special designation. (5-7, 14-3, 56-92, 78-8, 78-9)

Response: No change has been made in response to these comments. The boundary of the Walnut Canyon Study Area would be difficult to find on the ground, which would make implementation difficult. The Walnut Canyon Management Area boundary was developed with topographical features and landmarks in mind to make the boundary more locatable on the ground. The Walnut Canyon Study has been completed and transmitted to the Secretary of Agriculture. The study presents three options to the Secretary, one of which is consideration of the area for special designation, and the Forest is waiting for a recommendation on how to proceed.

Concern Statement #362: The Forest Plan should manage Walnut Canyon under a special land designation to protect its scenic, recreational, and ecological values. (56-93)

Response: The Walnut Canyon Study Area has been completed and transmitted to the Secretary of Agriculture. The study presents three options to the Secretary, one of which is the one you suggest. While the Secretary has the study under consideration, the Forest will not be taking any steps that limit the Secretary's decision space.

Although the Forest Plan does not manage Walnut Canyon under a special land designation, the plan components in the Walnut Canyon Management Area offer considerable protection to this area. Standards in this management area prohibit the development of new paved roads or utility corridors, and require that the land be maintained in the National Forest System. See MA-Walnut-S-1 and 2. A guideline in this management area requires that activities and uses on the Forest be managed to protect cultural sites and preserve habitat for disturbance-sensitive species both on the Forest and within the neighboring Walnut Canyon National Monument. See MA-Walnut-G-1. Another guideline requires permits for research

projects in rock shelters and archaeological site caves to protect archaeological and historical resources. See MA-Walnut-G-2. A management approach reminds managers to:

> Coordinate with the Walnut Canyon National Monument to develop and ensure compatible management of overlapping resources in this management area.

Concern Statement #368: The Walnut Canyon Management Area in the Forest Plan should include the following guideline related to recreation:

> **Walnut Canyon and its immediate surroundings form a uniquely precious area on the Coconino NF. Inside the canyon and within one mile of the rim, protection of cultural sites and preservation of habitat for disturbance-sensitive species will take precedence over recreation. Within the canyon, trail users will be strongly encouraged to stay on the trail. [Note. The paragraph above is not intended to affect the current alignment or use of the Arizona National Scenic Trail or other trails in the Forest Service System. Rather, the paragraph looks ahead to population growth in Flagstaff and to requests for additional recreational opportunities.] (61-3)**

Response: A guideline has been added to the Walnut Canyon Management Area in response to this comment. See MA-Walnut-G-1. Concerns related to recreation impacts on cultural resources and disturbance-sensitive species are also addressed in the forestwide plan components on Recreation. For example, desired conditions and guidelines emphasize low impact recreation principles and minimal resource conflicts. See FW-Rec-All-DC-5 and 6, and FW-Rec-All-G-2.

Concern Statement #182: The Mount Elden Management Area should be considered for wilderness designation or given a Recreation Opportunity Spectrum classification of primitive or semi-primitive non-motorized. (27-3, 56-83, 56-84)

Response: The Mount Elden area was considered for wilderness designation as part of the wilderness evaluation process the Forest conducted for the forest plan revision effort. The Mount Elden area was screened out during the inventory step of the evaluation. After boundary adjustments were made for private land, communication towers, Forest Service lookout tower, utility corridors, other special use permits, and associated roads, the area no longer met the 5,000-acre criteria for potential wilderness areas. It was removed from further consideration at that time.

The Mount Elden Management Area has not been assigned recreation opportunity spectrum (ROS) settings of primitive or semi-primitive non-motorized as suggested. The ROS settings for alternatives B, C, and D were mapped using a raster-based GIS approach that incorporated and elaborated on agency protocols established in 2003. Through the use of map algebra, naturalness, access, remoteness, facilities and site management were incorporated to identify the spatial arrangement of recreational opportunities and ROS classes throughout the Forest. The results of this modeling reflect that less than 10 percent of the management area should have an ROS class of semi-primitive non-motorized and none of the management area should have an ROS class of primitive. There is no sound rationale to adopt the commenter's suggestion, and to do so would create a situation where many existing uses in the area are inconsistent with the ROS class for the area.

Concern Statement #187: The Forest Plan should provide specific recreation direction for a Beaver Creek Management Area. (99-4, 99-5)

Response: Most of the plan direction related to recreation is addressed in forestwide direction, not management area direction. For example, for direction related to the topic of recreation opportunities, see FW-Rec-All-DC-2, 3, and 4, FW-Rec-Dev-DC-1, FW-Rec-Disp-DC-1, and FW-Rec-Trails-DC-1 and 2.

A Beaver Creek Management Area has not been identified as a separate management area in the Plan. The Beaver Creek area is still encompassed in the Verde Valley Management Area. However, in response to your comments, the Verde Valley Management Area plan components were reviewed, edited, and augmented. For example, desired conditions that guide access to recreational opportunities and trail system design have been added to the Verde Valley Management Area. See MA-VerdeV-DC-2 and 3. Several management approaches have been added to the Verde Valley Management Area to remind forest managers to:

> Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trail head planning and construction efforts.
>
> Work with stakeholders to develop collaborative solutions to problems that arise from high use recreation.
>
> Collaborate with the Montezuma Castle National Monument Staff to better meet visitor needs and protect resources in the vicinity of Montezuma Castle and Montezuma Well.
>
> Collaborate with Arizona State Parks to better meet visitor needs and protect resources in the vicinity of Deadhorse State Park.

Concern Statement #189: The Forest Service must add desired conditions, guidelines, standards, and management approaches to protect Forest resources in the Fort Valley/Mount Elden Management Area from damage caused by recreation. Mt. Elden is a rare mountain environment with a higher degree of natural diversity than the nearby San Francisco Peaks. Mt. Elden is immediately adjacent to Flagstaff, and is currently environmentally threatened due to recreational pressure. As stated in the Draft Plan numerous times (e.g., see Chapter 1 of Draft Plan) - this forest is subject to significant impacts from climate change, increasing population growth, increasing recreational demand, increasing recreational conflicts, new types of recreation demands, and increasing pressure on forest resources. Mount Elden supports diverse vegetation communities adapted to differing temperature and moisture regimes, and these habitat types support carnivores and their prey, large mammals such as mountain lions, deer winter habitat, as well as a variety of bird species. There are also archaeological resources, which are being damaged by recreational users including downhill bicycling. Yet, there is no mention of Mount Elden's ecological and archaeological resources in the description given in the Draft Plan – the area is instead treated as a recreational playground. The Forest Service must add a description of ecological and archaeological resources of the Fort Valley/Mount Elden Management Area. Damage to resources from recreation is currently occurring. (56-82)

Response: The General Description and Background section for the Mount Elden Management Area in the revised Plan has been adjusted in response to this comment. Additional information on the ecological and archaeological resources in this management area have been added to the General Description and Background section. Furthermore, the plan components in the management area were reviewed, edited, and augmented in response to this comment. See Mount Elden Management Area section in the Forest Plan to review the desired conditions, standard, guidelines, and management approaches that apply to this management area.

Concern Statement #177: The revised Plan should include a separate management area for Beaver Creek. (89-3, 91-1, 96-1, 99-1)

Response: A separate Beaver Creek Management Area has not been added to the revised Plan. The Beaver Creek area is still included within the Verde Valley Management Area. Although a separate

management area was not created for the Beaver Creek area, the language suggested for the new management area was reviewed and incorporated whenever appropriate into the Verde Valley Management Area. See MA-VerdeV-DC-1, 2, 3, and 4, MA-VerdeV-G-1, 2, and 3, and the following management approaches:

> Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trail head planning and construction efforts.
>
> Work with stakeholders to develop collaborative solutions to problems that arise from high use recreation.
>
> Collaborate with the Montezuma Castle National Monument Staff to better meet visitor needs and protect resources in the vicinity of Montezuma Castle and Montezuma Well.
>
> Collaborate with Arizona State Parks to better meet visitor needs and protect resources in the vicinity of Deadhorse State Park.

Concern Statement #183: The Forest Service should provide "Tread Lightly" and "Leave No Trace" training for residents and youth in partnership with the Beaver Creek School, Arizona State Parks OHV Ambassador Program, the Beaver Creek Trails Coalition, the Beaver Creek Kiwanis Club, and Yavapai County. This is needed to reduce OHV damage to the area. (99-15)

Response: The "Tread Lightly" and "Leave No Trace" concepts have been addressed in a forestwide desired condition, which applies to the Beaver Creek area. See FW-InterpEd-DC-1. A management approach in the Interpretation and Education section also provides the following suggestion:

> Share Leave No Trace and Tread Lightly concepts and practices in forest interpretation and visitor education.

Concern Statement #361: The Forest Plan should be adjusted to include a Beaver Creek Management Area that would include the following information in the General Description and Background:

> **The Beaver Creek Management Area is predominantly Semidesert Grasslands, Pinyon Juniper Woodlands and Riparian. It is characterized and defined by the beautiful free-flowing Beaver Creek perennial Beaver Creek and the perennial portions of Walker and Dry Beaver Creeks. It is further defined by many intermittent streams including the Riparian Areas along Dry Beaver Creek, Walker Creek, Red Tank Draw and Russell Wash. The area has a continuous history of human occupation and comprised the southern Sinagua culture area until A.D. 1400 as highlighted by Montezuma Castle, Montezuma Well, Sacred Mountain, V Bar V Rock Art Area, and numerous large Pueblos spaced approximately 1.6 miles apart along the rim of Beaver Creek. The Beaver Creek Area has a long history of prehistoric and historic settlement as highlighted by national monuments and historic trails within the forest's administrative boundary. It is also characterized by a ranching history including portions of the Historic V Bar V, Ward, Bar D, Apache Maid and M Diamond Ranches. The Beaver Creek MA is Rimrock, Lake Montezuma and McGuireville's "Back Yard" as it is next to many residential areas, sections of Interstate 17, the Cornville Road, the Montezuma Well Road and a several mile stretch of Beaver Creek. (99-2)**

Response: Although a Beaver Creek Management Area has not been identified as part of the Forest Plan, in response to your comments, the General Description and Background for the Verde Valley

Management Area was reviewed, edited, and augmented. For example, general description information has been added to the Verde Valley Management Area that highlights some of Beaver Creek's contributions to this management area.

Concern Statement #485: The Forest Plan should include a management approach to expand partnerships with neighborhoods to promote trail and resource stewardship in the Beaver Creek area. (99-16)

Response: The suggested management approach has not been added to the management area that encompasses Beaver Creek, because similar language already exists in the forestwide Trails section of the Forest Plan. It states:

> Maintain and expand volunteer partnerships with local communities, organizations, groups, and agencies to assist in trail planning, construction, and stewardship.

Concern Statement #487: The Forest Plan should include a management approach to collaborate on trail planning in the Beaver Creek area. (99-14)

Response: A management approach has been added to the Verde Valley Management Area section of the Forest Plan in response to this comment. The management approach states:

> Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trail head planning and construction efforts.

Concern Statement #188: The Forest Plan should include the following management approach in a new management area covering the Beaver Creek area:

> **Collaborate with the Montezuma Castle National Monument Staff to better meet visitor needs and protect resources in the vicinity of Montezuma Castle and Montezuma Well.**
>
> **(99-11)**

Response: A management approach has been added to the Verde Valley Management Area section of the revised Plan in response to this comment. The management approach states:

> Collaborate with the Montezuma Castle National Monument Staff to better meet visitor needs and protect resources in the vicinity of Montezuma Castle and Montezuma Well.

Concern Statement #186: The Forest Plan should apply more restrictive management in the Flagstaff Neighborwoods, Sedona Neighborwoods, Oak Creek, Red Rock, and House Mountain-Lowlands management areas. For example, these management areas should have a Recreation Opportunity Spectrum classification that allows less development. The management areas should eliminate livestock grazing and forbid recreational shooting. Dispersed camping sites, recreational shooting and disturbances with the Kelly Motorized Trail System should be limited. Dispersed recreation of campers/RVs and motorized recreationists should be controlled to prevent the spread of invasive species and damage to native vegetation. (56-105)

Response: No adjustments were made in response to this comment. ROS classes are based on the conditions present. One of the criteria that would move an area to a more developed ROS class would be the fact that it is near a more developed area, such as a neighborwood. Applying a more primitive ROS class to these areas would be contrary to the ROS process.

The Forest Plan does not contain decisions to eliminate domestic livestock grazing or recreational shooting in these areas. The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. It does not contain project and activity decisions such as permitting or prohibiting occupancy, use or access. Decisions to close an area to domestic livestock grazing or recreational shooting are determined at the project level based on site-specific information. The Forest Plan provides guidance for those projects. For example, an All Recreation guideline requires recreational activities and locations to be managed to have minimal user conflicts. See FW-Rec-All-G-2. This direction may help guide a project that is considering the propriety of recreational shooting in a particular area.

The same is true for the suggestion to limit activities associated with the Kelly Motorized Trail System. The Forest Plan does not include specific decisions on these activities or uses. However, the Forest Plan does provide guidance that would influence management decisions on these activities and uses. Providing a broad spectrum of developed and dispersed recreation settings and minimizing user conflicts are desired conditions of the Forest Plan. See FW-Rec-All-DC-4 and 6. As noted above, the Forest Plan includes an All Recreation guideline that requires recreational activities and locations to be managed to have minimal user conflicts. See FW-Rec-All-G-2. This forestwide direction applies to the entire Forest, including the neighborwood management areas. It provides sufficient direction to guide projects under consideration in the neighborwood management areas.

Decisions to control dispersed motorized camping and motorized recreation are also made at the project level. Specific access and motorized use determinations are made through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). The Forest Plan contains a standard that acknowledges the motor vehicle use maps, which are produced as part of the implementation of the Travel Management Rule. Camping corridors for motorized dispersed camping are identified on the motor vehicle use maps. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1:

> Motorized vehicle use shall occur as identified on a designated system of roads, trails, and areas (including locations designated for motorized big game retrieval), as defined on motor vehicle use maps, except for those uses authorized by law, permits, and orders in connection with resource management and public safety.

Concern Statement #202: The Forest Plan should allow vegetation management in utility corridors in the Oak Creek Canyon Management Area. (69-23)

Response: This Oak Creek Management Area standard has been adjusted in response to your comment. The phrase "forest products" was replaced with the term "commercial plant collection" to clarify that this standard only applies to commercial plant collection. The concern relating to vegetation management associated with utility corridors near riparian areas is also addressed by a Special Uses desired condition that acknowledges the need and legal mandate to manage vegetation in utility and energy corridors. See FW-SpecUse-DC-2.

Concern Statement #360: The Flagstaff Neighborwoods, Sedona Neighborwoods, Fort Valley/Mount Elden, and San Francisco Peaks Management Areas, along with the Fossil Creek area and other areas with heavily used trails should have management approaches related to neighborwood patrols that incorporate the following concepts.

Volunteers should be incorporated into visitation, education and sanitation efforts of "Neighborwoods Patrols" to create a sense of ownership, and all actions must be tailored to specific areas. However, to ensure consistency, these projects should be led by Forest Service staff. Examples include instituting volunteer-driven, Forest Service initiated, "Resource Steward" challenges to the Kelly Trail System users community even before the System is completed. Areas to

work on would include official Kelly Trail System trailheads at Lake Mary Rd. and Munds Park trailheads. Volunteer blackberry abatement and other invasive weed eradication at Flagstaff, Sedona, and Oak Creek Canyon area official and social trailheads must be addressed with strategies tailored to specific forest and riparian sites. The Forest Service must incorporate Forest Service staff with volunteer engagement as well as coordination with appropriate regional environmental corps. Multi-agency coordination can result in management cost reductions, generate a wider variety of trends toward ideal conditions and more intra-regional opportunities for user engagement. (56-106)

Response: A management approach suggesting "neighborwood patrols" by volunteers has not been added to any of the management area sections. The concept of working with volunteers and other organizations is already addressed in a forestwide All Recreation management approach, which states:

> Collaborate with State and Federal agencies including National Park Service, Arizona State Parks, AZGFD, concessionaires, chambers of commerce, nonprofit organizations, Northern Arizona University, state, city and county governments, recreation stakeholders, local communities and citizens, partners and volunteers regarding provision of recreation opportunities in northern Arizona and communicating these to the public. Work in partnership to find creative solutions to operate and maintain recreation sites, trails and trailheads, and provide interpretive and environmental education. Determine gaps and overlaps in opportunities and resolve conflicts between users and providers. Work together to determine activities that increase our capacity to serve a diverse population while promoting social, economic, and natural resource sustainability.

Concern Statement #618: The Forest Service should confirm whether outfitter-guided horse trips are actually authorized on the Fisher Point Trails as mentioned in the General Description and Background for the Walnut Canyon Management Area section in the Forest Plan. (56-96)

Response: The Forest Plan has been adjusted in response to this comment. The General Description and Background in the Walnut Canyon Management Area reflects that Fisher Point is a popular destination. The reference to outfitter-guided horse trips has been removed.

Concern Statement #619: It should be noted that a large portion of the northwestern portion of Anderson Mesa is now designated as an Important Bird Area by Audubon due to the Seasonal Wetlands found there, as such a robust, diverse small plant community is vital. (64-33)

Response: The Forest Plan has been adjusted in response to this comment. The General Description and Background section for the Anderson Mesa Management Area acknowledges that this management area contains the Anderson Mesa Important Bird and Biodiversity Area.

Concern Statement #715: The Forest Service should provide information on how proposals for special management areas were handled and develop an alternative that proposes to designate Anderson Mesa as a special management area. (64-54)

Response: The Analysis of the Management Situation explains how the Forest leadership team handled the Special Area proposals that were made during this forest plan revision effort. The Forest leadership team considered the proposals submitted for new Special Areas and acknowledged that there are many places on the Forest that people value for both social and ecological reasons. The Forest leadership team decided that the intent of the Special Area proposals should first be considered for incorporation into components of the revised Plan, such as desired conditions, where they would be appropriate. The reasons for this are because:

- many of the proposals could be included in the desired conditions for the areas of interest,

- Special Area designation would not necessarily offer any additional protections to that of plan components, and
- there is currently limited staff available to complete the required NEPA analysis for new Special Areas.

Accordingly, efforts were made to incorporate the intent of the Special Areas into the desired conditions in the proposed revised plan. These efforts were largely successful and so many Special Area proposals were not carried forward. The Forest leadership team reviewed the remaining proposals that were not incorporated to see if any of them warranted recommendation as a Special Area or other action.

The proposals for a special area that encompasses Anderson Mesa were merged and retained in an alternative to the proposed revised plan. Although alternative C does not recommend or designate Anderson Mesa as a "special area," it does include a management area for Anderson Mesa that incorporates the intent of the proposals to give Anderson Mesa some level of special area status. The Anderson Mesa Management Area in alternative C in the environmental impact statement places additional emphasis on the ecological resources in the area and the preservation of semi-primitive and primitive settings. This management area includes many plan components that are designed to articulate and embody this emphasis. See appendix F in the environmental impact statement for additional information on the Anderson Mesa Management Area that is proposed under alternative C.

Management Indicator Species

Concern Statement #2: The Forest Plan should identify management indicator species (MIS) for more of the vegetation types on the forest, including vegetation types that provide habitat for TES species. The Forest Service should explain why the proposed forest plan includes fewer MIS species than the 1987 forest plan. (5-2, 56-6, 56-53, 74-54, 84-31, 84-106)

Response: There is no requirement to select a management indicator species (MIS) for every ecological response unit (ERU). Rather MIS were selected for ERUs where management activities and restoration objectives are planned and change would be expected during the life of the plan: Ponderosa Pine (Gambel oak sub-type), Mixed Conifer with Infrequent Fire, and Mixed Conifer with Frequent Fire ERUs (Mexican spotted owl), Ponderosa Pine (old growth and snags) ERU (pygmy nuthatch), and grassland ERUs (pronghorn). Threatened, endangered, and sensitive (TES) species have individual analyses in the environmental impact statement and the Biological Assessment and Biological Evaluation (found in the plan set of documents). Gunnison's prairie dogs are discussed in the Biological Assessment because they are a primary food item for black-footed ferrets as well as in the Final Environmental Impact Statement and the Species Viability Report (USDA Forest Service 2017b).

Application of the 17 MIS identified in the 1987 plan was not useful because some species are habitat generalists (e.g., elk use grasslands, woodlands, forests, riparian areas, etc.) so their populations are not closely tied to management in any one habitat or ERU. In addition, population changes of some 1987 plan MIS were too difficult to assess compared to influences (e.g., macroinvertebrates in watersheds that have more influencing factors than can be measured). Additional details on the review of the 17 MIS identified under the 1987 plan can be found in the Management Indicator Species Status Report for the Coconino National Forest (USDA Forest Service 2013a) found in the plan set of documents.

Also, in lieu of selecting for a whole variety of birds that can be influenced by management and a broad range of species associated with water on the Coconino NF, two "ecological indicators" were selected. Aspen is an ecological indicator of habitat diversity, and early seral stages in the following ERUs: Mixed Conifer with Infrequent Fire, Mixed Conifer with Frequent Fire, Spruce-Fir, and in localized areas in Ponderosa Pine. The Monitoring Plan has a question that reads: How much have management activities contributed to maintaining or moving toward desired conditions for aspen?

Aquatic macroinvertebrates were selected as an ecological indicator of water quality. The Monitoring Plan has a question that reads: Have management activities contributed to impairment of warm water or cold water streams based on aquatic macroinvertebrate metrics?

Concern Statement #249: The Forest Service should adjust the standard for Semi-Desert Grasslands in the Forest Plan that states recreation goals are subordinate to antelope protection (see Draft Revised Plan, FW-Veg-Grass-SDG-S-1). This type of statement, since standards are absolute, will also probably be unattainable in every instance and will likely pit those interest groups against each other, and the Forest. (44-9)

Response: This standard has been removed from the Forest Plan in response to this comment. In its place, several plan components address the potential impacts of recreation on pronghorn in the same manner that other potential conflicts between activities and resources are handled in the Forest Plan. The forestwide direction for Wildlife, Fish, and Plants contains several desired conditions related to wildlife habitat, which includes pronghorn habitat. See FW-WFP-DC-1, 2, and 3, FW-WFP-G-13, and FW-Rec-Trails-G-1. A guideline for All Recreation in the Recreation section of the Forest Plan ties back to these Wildlife, Fish, and Plants desired conditions, requiring recreational activities to be managed to maintain or move toward the desired conditions for other uses and resources. See FW-Rec-All-G-1.

Concern Statement #747: The Forest Service should not rely on pronghorn populations as an indicator of the quality of habitat on the Forest because pronghorn populations are managed by the Arizona Department of Game and Fish. (22-3, 34-4)

Response: The 1982 Planning Rule regulations list several categories of species that shall be considered (although not necessarily included) for Management Indicator Species status. One of those categories involves species that are commonly hunted, fished, or trapped. See 36 CFR 219.19(a)(1).

As disclosed in the environmental impact statement in the Management Indicator Species section in chapter 3, pronghorn were selected as a management indicator species for three reasons. First, pronghorn are a good indicator for grassland health. As the environmental impact statement discusses, grassland conditions on the Forest are either highly departed or trending away from historical reference conditions. Selecting pronghorn as a management indicator species gives the Forest a way to consider whether management activities are creating the desired responses to grassland conditions. Second, pronghorn are a management indicator species on the neighboring Kaibab and Prescott National Forests. Having similar management indicator species can provide opportunities to apply broad-scale monitoring considerations to pronghorn. Third, the Arizona Department of Game and Fish monitors pronghorn, which provides the Forest with a cost-effective source of monitoring data on this species.

Mineral Resources

Concern Statement #286: The Forest Plan should establish more new wilderness areas and special areas which would result in more acres being withdrawn from mineral entry. Areas withdrawn from mineral entry can offer wildlife and plant species a better opportunity to survive and persist in the presence of changing climate and increasing wildfire risk. (56-130, 56-135)

Response: The Forest Plan recommends three wilderness areas (Abineau, Davey's, and an extension to the existing Strawberry Crater Wilderness), the Cottonwood Basin Geological and Botanical Area, two new Research Natural Areas, and a proposed expansion to an existing Research Natural Area. Forest Service Manual 2760 directs that withdrawals should be considered for areas with a history of mineral findings and in which the management direction is not compatible with alienation or use under the mining laws; for example, research natural areas, interpretive or cultural sites, scenic areas, geologic areas, critical habitat of endangered species having a very limited range and specific habitat requirements not found elsewhere, and botanical areas. There are almost no areas on the Forest with “a history of mineral

findings" and there is low mineral potential on the forest. The only active mine is the Verde Gypsum Mine, most of which is on State and private lands. It is likely that the Forest will continue the two existing mineral withdrawals (San Francisco Peaks Mountain Elden Recreation Area and Oak Creek Canyon Recreation Area). The Forest Service Manual also suggests considering alternatives to withdrawals to protect areas (see FSM 2761.4).

The Forest Plan has three guidelines related to withdrawals. See FW-Minerals-G-1, 2, 3. These guidelines recommend areas to be considered for withdrawal for locatable minerals; recommend renewing existing withdrawals if withdrawal is the only way to protect the values; and identify withdrawal areas to be considered for no surface occupancy, no leasing, or other leasing stipulations for leasable minerals. In addition, a management approach for Mineral Resources reminds managers to:

> Consider withdrawing congressionally designated areas from entry and operations for locatable minerals (or other approaches) if withdrawal was not a part of the establishing legislation for the designated area. Prioritize mineral withdrawals where mineralization poses the most risk.

Concern Statement #385: The Forest Service should modify the Energy and Minerals section of the revised plan to include managing for energy from power utility rights-of-way. The Forest Service should also include that vegetation management in these rights-of-way needs to comply with utility vegetation laws and regulations. (69-15)

Response: The "Minerals and Energy" section has been renamed the "Mineral Resources" section in response to this comment. The "energy" was previously included in the title because this section deals with, among other things, leasable minerals. Many leasable minerals, such as oil, gas, and geothermal resources are sources of energy. This section is not intended to address energy production and transmission facilities. Those forest uses are addressed in the Special Uses section.

The Special Uses section contains plan components that acknowledge laws and regulations related to vegetation management in utility rights-of-way. See FW-SpecUse-DC-2 and FW-SpecUse-G-6.

Concern Statement #386: The Forest Plan should include plan components that manage disturbances from geothermal energy development to protect cultural and ecological resources. (56-133)

Response: The Forest Plan contains several plan components that would manage potential disturbances from geothermal energy development to protect cultural and ecological resources. Geothermal resources are considered leasable minerals. The Mineral Resources section includes a guideline that requires no surface occupancy, no leasing, or other leasing stipulations for leasable minerals in numerous areas, including:

- Areas of very high scenic integrity not located in wilderness, designated and eligible wild and scenic rivers, or other withdrawals.
- San Francisco Peaks/Mount Elden Recreation Area withdrawal.
- Areas of very high archaeological site density (greater than 60 sites per square mile) and potentially eligible for the National Register of Historic Places.
- Areas with Federally threatened or endangered, or Forest Service sensitive species.
- Traditional cultural properties where historic preservation laws alone do not adequately protect the cultural resource.

See FW-Minerals-G-3. Another guideline requires the protection of important wildlife and plant habitats, visually sensitive areas, archaeological sites, places of cultural importance to American Indians, and areas

with large capital investments through the use of surface occupancy restrictions, mitigation measures, and operating plan requirements imposed on mineral activities. See FW-Minerals-G-4. A management approach in this section reminds forest managers to:

> Incorporate BMPs and stipulations into future leases as appropriate to the location from the "Final Programmatic Environmental Impact Statement for Geothermal Leasing in the Western U.S." (Bureau of Land Management 2008) or more current direction.

The desired conditions for cultural and ecological resources and management areas included in the Forest Plan will also guide any decisions on geothermal development.

Concern Statement #476: The Forest Plan should include stringent guidelines to limit future surface occupancy and leasing for mineral development, which will help to protect the social, cultural, and ecological values of forest areas. Considering that Forest Plan revisions take place once every 15 years, and that technological advances in mineral extraction can occur rapidly (e.g., hydro-fracturing of oil shale has developed in the past 10 years, and is now occurring in many neighboring states), it is important that stringent mineral development guidelines are already in place to ensure long-term protection of natural resources within Coconino NF. (56-132)

Response: No change has been made in response to this comment. In addition to an array of desired conditions that would guide any future responses to leasing applications, the Plan includes a guideline that requires the consideration of No Surface Occupancy and other protections to protect a wide variety of resources. See FW-Minerals-G-3. FW-Minerals-G-1 and 2 also address mineral withdrawal.

Concern Statement #387: The Forest Plan should include direction to withdraw geological areas from mineral entry and to retain existing mineral withdrawals. (56-133)

Response: The guideline to consider withdrawing geological and botanical areas that are not in wilderness has been retained. See FW-Minerals-G-1. The guideline to maintain the existing mineral withdrawal for the San Francisco/Mount Elden Recreation Area and Oak Creek Canyon Recreational Area has been modified in several ways. First, the express mention of the San Francisco/Mount Elden Recreation Area and Oak Creek Canyon Recreational Area has been removed and the guideline has been edited to apply to all existing mineral withdrawals. Second, the intent has been clarified to indicate that renewal of existing mineral withdrawals should be pursued when that is the only way to protect identified social, cultural, and ecological surface resource values and current law and the locatable surface use regulations do not provide adequate protection. See FW-Minerals-G-2. This guideline is consistent with agency policy regarding withdrawals found in Forest Service Manual 2761.03.

See Forest Service Manual 2761.4 for a listing of alternative protection opportunities that could be used instead of withdrawals to protect surface resources.

Concern Statement #200: The revised Plan should address the ongoing operations at the White Vulcan Mine. (53-3)

Response: No changes to the revised Plan have been made in response to this comment. The White Vulcan Mine began mining block pumice in the 1980s. In 2000, a settlement agreement was reached to with the mine owner/operator to close the mine. The mine owner/operator reclaimed the mine in 2010-2011, ending the mine's operation.

The revised Plan includes plan components related to minerals and mining activities in the Minerals Resources section.

Concern Statement #477: The Forest Plan should require the San Francisco Volcanic Field and the Verde Hot Springs to be withdrawn from mineral entry to protect plant and wildlife species from habitat disturbance. (56-134)

Response: No change has been made in response to this comment. Per Forest Service policy, requests for withdrawal from mineral leasing should be made rarely. See FSM 2761.04. Existing public laws, Federal regulations, and leasing stipulations provide substantial opportunities (FSM 2822.2) to accommodate both surface resources and the recovery of leasable minerals. The Forest Plan is not silent on this topic. It includes a guideline in the Mineral Resources section that lists areas that should be considered for withdrawal for locatable minerals. See FW-Minerals-G-1. If it is consistent with this existing policy and this guideline, the San Francisco Volcanic Field and the Verde Hot Springs could be considered for mineral withdrawal. That determination would be made at the project level based on site-specific information.

The Forest Plan contains plan components that would guide decisions on requests for geothermal development. For example, see FW-Eco-DC-1, FW-BioPhys-Geo-DC-1, FW-Water-DC-1, 2, and 3, and FW-FWP-DC-1, 2, and 3. Specific protections and design features would be identified at the project level based on the activities that are proposed and the specific species that could be impacted.

Concern Statement #484: The Forest Plan should update the 1872 Mining Act. (53-2)

Response: Making changes to the 1872 Mining Act is outside the scope of the Forest Plan.

Monitoring

Concern Statement #205: The Forest Service should revise the Monitoring Plan to add clarity and specificity. (63-3, 65-10, 65-11, 65-12, 65-15)

Response: The Monitoring Strategy and Plan in the Forest Plan have been reviewed and modified in response to this concern. See chapter 5 of the Forest Plan. Key changes include clarifying the questions, identifying the scale, and having more easily understood metrics that tie to the data sources for each monitoring question. Acronyms were spelled out in place and a footnote was added to provide additional information on the data sources that would be used by the Monitoring Plan.

Concern Statement #280: The Forest Plan should add specific details, exact plans of action, metrics for desired future conditions, metrics for monitoring, and metrics for enforcement of regulations. (27-1, 56-140)

Response: The Forest Plan is, by design, strategic in nature. It focuses on desired conditions that are described in qualitative and quantitative terms. The Forest Plan sets forth objectives that are measurable, anticipated results that help achieve or move toward desired conditions over the life of the Forest Plan. The specific details on how projects will be designed and conducted will be established as projects are developed, taking site-specific information into account to ensure that the project maintains or moves the Forest toward the desired conditions in the Forest Plan.

Monitoring to determine the effectiveness of the Forest Plan is discussed in the Monitoring Strategy in chapter 5 of the Forest Plan. The Monitoring Plan has been reviewed and adjusted to ensure that each monitoring question identifies the metrics that will be used to help answer the monitoring question.

Concern Statement #369: The Monitoring Plan in the Forest Plan should use multiple scales when possible to process and answer monitoring questions. (65-13)

Response: The Monitoring Plan has questions at scales larger than the plan area (question numbers 1 and 2), at the scale of habitat for threatened, endangered, and proposed species (questions 19 and 22a), and at

the geographic scale of the Forest (remaining questions – there are 31 total). Most of the questions in the Monitoring Plan are designed to answer the following questions:

- What are the effects of resource management activities on the productivity of the land?
- To what degree are resource management activities maintaining or making progress toward the desired conditions and objectives identified in the plan?
- What modifications are needed to account for unanticipated changes in conditions? Can changes be attributed to climate change?

In addition to annual monitoring, the forest supervisor reviews the conditions on the land covered by the plan at least every 5 years to determine whether conditions or demands of the public have changed significantly. The plan is ordinarily revised on a 10- to 15-year cycle and the forest supervisor may amend the plan at any time. All of the monitoring and evaluation timeframes identified in this chapter begin from the date of the record of decision.

Consequently, the monitoring questions are seeking information aggregated to a landscape scale. Project-level activities will develop monitoring appropriate to the project and resources that are potentially impacted. This project-level monitoring information feeds into many of the data sources that the Monitoring Plan will use to answer the monitoring questions.

Concern Statement #370: The questions in the Monitoring Plan in the Forest Plan should be more focused on the resource conditions. (63-1, 63-2)

Response: Many of the monitoring questions in the Monitoring Plan have been adjusted in response to this suggestion. Some questions simply ask if certain elements in the desired condition for a resource are within the range of desired conditions. Other questions follow the example offered by the commenter and ask how management activities have contributed to maintaining or making progress toward the desired conditions for particular resources.

Concern Statement #371: The complete monitoring plan, including study design and analysis protocols, should be made available for public review and comment before a decision is made to revise the Forest Plan. The Center has specific questions about the monitoring plan, including but not limited to: (1) criteria for selection of measurable indicators of change; (2) sampling design power analysis and expected observational error rates; (3) sampling procedures including monitoring cycle; (4) confidence levels to be applied in data analysis and reporting; (5) timeframe for evaluation of results; (6) triggers for management adaptation using new information; and (7) funding sources. (56-146, 84-28, 84-71)

Response: The Monitoring Plan is chapter 5 in the Forest Plan. It was sent out for public comment in December 2013, and it has been modified in response to public comments.

Monitoring and evaluation are separate and sequential activities required by National Forest Management Act regulations to determine how well the plan is working. Monitoring involves collecting data by observation or measurement. Evaluation involves analyzing and interpreting monitoring data.

The purpose of the Monitoring Plan is to evaluate, document, and report how the Forest Plan is applied, how well it works, and if its purpose and direction remain appropriate. Based upon this evaluation, recommendations may be made to the Forest Supervisor to change management direction, or revise, or amend the Forest Plan. The monitoring and evaluation report is intended to inform adaptive management of the plan area especially in light of changing social or environmental conditions.

In general, annual evaluations of the monitoring information consider the following questions:

- What are the effects of resource management activities on the productivity of the land?
- To what degree are resource management activities maintaining or making progress toward the desired conditions and objectives identified in the plan?
- Have there been unanticipated changes in conditions? Can changes be attributed to climate change? What modifications are needed to account for these changed conditions?

The following guiding principles are key elements of the monitoring strategy and serve as a framework for implementing an effective monitoring and evaluation program:

- Monitoring efforts are efficient, practical, and affordable, make use of the best available science, and do not duplicate the collection of data already underway for other purposes.
- Monitoring tasks are scaled to the desired condition, objective, or management area direction to be monitored.
- Monitoring is not performed on every single activity, nor does it need to meet the statistical rigor of formal research.
- Budgetary constraints may affect the level of monitoring that can be done in a particular fiscal year. If budget levels limit the Coconino NF's ability to perform all monitoring tasks, then those items specifically required by law are given the highest priority.
- Opportunities to complete monitoring and evaluation activities through partnerships and citizen collaboration are examined on a regular and ongoing basis.
- A monitoring and evaluation report is prepared that summarizes the results of completed monitoring and evaluates the data for indicators of trends or effects.
- The forest supervisor evaluates the monitoring information displayed in the evaluation reports through a management review and determines if any changes are needed in management actions or the forest plan itself.
- The public is given timely, accurate information about forest plan implementation. This is done through the release of a monitoring and evaluation report.

The Forest Plan is ordinarily revised on a 10- to 15-year cycle and the Forest Supervisor may amend the plan at any time. All of the monitoring and evaluation timeframes identified in this chapter begin from the date of the record of decision.

The monitoring plan includes the following information for each of the 31 monitoring questions:

- **Monitoring Question**: The question(s) that will be answered. All questions are at the geographic scale of the forest unless indicated otherwise.
- **Metrics and Data Sources**: The evaluation criteria and data sources available to evaluate the monitoring questions at the time of plan approval. These are not the required methods of measurement. As new tools become available, other methods may be used to answer the monitoring questions.
- **Frequency of Monitoring**: How often information is gathered or measured. Most items are monitored annually. One item is monitored every 10 years. That item asks "Have areas classified as unsuited for timber production become suitable?"
- **Frequency of Evaluation**: How often the information is analyzed and reported. Available monitoring information will be evaluated and reported every two years.

- **Data Precision and Reliability**: An indication of how rigorous the information used to evaluate the monitoring question is with respect to repeatability, reliability, accuracy, and precision. Two categories of precision and reliability are appropriate at the plan scale, and because of varying methods and data sources used to evaluate the monitoring question, both classes may be indicated. Classes of precision and reliability, however, are not meant to identify which methods and data sources may be most appropriate to answer the monitoring question.
- **Class A**: Methods that are generally well accepted for modeling or quantitative measurement. Results have a high degree of repeatability, reliability, accuracy, and precision.
- **Class B**: Methods or measurements that are based on project records, personal communications, ocular estimates, pace transects, informal visitor surveys, and similar types of assessments. The degree of repeatability, reliability, accuracy, and precision are not as high as Class A methods, but they still provide valuable information.

Monitoring and evaluation are identified, approved, and scheduled through the annual budget process. Actual budget levels, funding emphasis, and emergence of new issues may affect accomplishment of both management activities that make progress toward desired conditions as well as monitoring. Partnerships may be developed to accomplish monitoring and evaluation.

Concern Statement #622: The Forest Plan should include a monitoring plan developed to ensure that the Forest is meeting or moving toward desired conditions, not on projected budgets. (74-9, 74-11)

Response: The plan components, including the Monitoring Plan, were developed to be realistic and able to be implemented within anticipated future budgets (expected to be similar to current budgets). Chapter 1 of the Forest Plan acknowledges that objectives to achieve desired conditions are strongly influenced by recent trends, past experiences, and anticipated staffing levels and short-term budgets. Chapter 5 of the Forest Plan acknowledges the uncertainties related to monitoring and evaluation relative to funding and prioritization as required by the National Forest Management Act:

Monitoring and evaluation are identified, approved, and scheduled through the annual budget process. Actual budget levels, funding emphasis, and emergence of new issues may affect accomplishment of both management activities that make progress toward desired conditions as well as monitoring. Budgetary constraints may affect the level of monitoring that can be done in a particular fiscal year. If budget levels limit the Coconino NF's ability to perform all monitoring tasks, then those items specifically required by law are given the highest priority. Partnerships may be developed to accomplish monitoring and evaluation.

The Socioeconomic Analysis section in chapter 3 of the environmental impact statement describes the program costs for each alternative.

Concern Statement #630: The Forest Plan should describe the process for disclosing the results of the monitoring plan to provide the public with a clearer understanding of the challenges the Forest is facing; if desired conditions are being achieved; and if they are not being achieved, what measures are needed to achieve them or whether they can ever be achieved in the monitoring evaluation process. The Draft Plan should:

- **Develop a public notification and reporting process to identify desired conditions progress based on monitoring.**
- **Identify in the Draft Plan the monitoring strategy baseline conditions in 1987 and how they relate to currently recommended desired conditions. Explain whether the progress against the desired condition has been made since 1987 or whether we are on a declining path.**

- **Publish a yearly monitoring report inclusive of all activities for desired conditions, species protection, and those required by forest regulation and statute.**
- **Establish a guideline that requires public disclosure of the forest supervisor's annual review of monitoring program along with any management decisions affecting desired conditions. Also identify if changing conditions in the forest requires a change in management direction.**

These public disclosures should be broad announcements that new information is now available on the website and specifying that information. (74-10, 74-12)

Response: As suggested by the Introduction to the Monitoring Strategy section, an evaluation report that summarizes the results of completed monitoring and evaluates the data for indicators of trends or effects is prepared for consideration by the Forest Supervisor. The evaluation report documents how the Forest Plan is applied, how well it works, and if its purpose and direction remain appropriate. The Forest Supervisor uses the evaluation report as a tool to determine if any changes are needed in management actions or the Forest Plan itself. The evaluation report is posted on the Forest's website and available for public review. The Introduction to the Monitoring Strategy section has been updated to confirm that the public will be given timely, accurate information about Forest Plan implementation. This is done through the release of the monitoring and evaluation report. The Forest Plan does not develop a particular process for public notification of this report. Currently, the Forest posts these reports to the Forest's website as they become available.

If the Forest Supervisor decides that management actions or the Forest Plan itself may need to be changed, specific proposals will be developed at that time. Proposals to change management actions or the Forest Plan would need to be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual, and include analysis and opportunity for public involvement. The public involvement process would depend on the specific proposal.

In preparation for plan revision, the Coconino NF identified guidance in the 1987 plan, which is working, new conditions that need to be addressed, and ongoing challenges that could be better addressed. This preparatory work is documented in the Analysis of the Management Situation, which was completed in May 2010 (USDA Forest Service 2010a). Through the Analysis of the Management Situation, the Coconino NF identified current ecological and socioeconomic conditions and trends taking place on the Forest and the associated "needs for change" to be addressed in the revised plan. The needs for change are grouped under three broad revision topics: (1) recreation, (2) forest community interaction, and (3) maintenance and improvement of ecosystem health.

Concern Statement #347: The Forest Plan should be adjusted to provide additional information regarding the reference to required monitoring in the Introduction for the Monitoring Strategy in Chapter 5. What is the definition of "Required" monitoring? And who is required to do it? Given the monetary constraints of Range Staff, how will this play out? (58-13)

Response: The Monitoring Strategy and Plan included in chapter 5 of the Forest Plan was developed to address the Forest's obligation to conduct monitoring under the 1982 Planning Rule provisions while considering Forest staffing and budget levels over the life of the Forest Plan. Many of the monitoring questions have been adjusted to clarify the measure and data sources being used to answer the question. Whenever possible and appropriate, the Forest has sought to use existing data collection efforts to answer the monitoring questions, which is intended to reduce the cost (both in dollars and in personnel) for monitoring.

The sentence to which this comment is referring is no longer in the Monitoring Strategy and Monitoring Plan. Instead, the introduction states that "[M]onitoring and evaluation are separate and sequential

activities required by National Forest Management Act regulations" and there is no longer any reference to required monitoring elements.

Concern Statement #94: The Forest Plan should require the monitoring of effects to listed species and aquatic resources. (84-101)

Response: The propriety and amount of monitoring that should be conducted on site-specific actions varies based on the action and is determined through the analysis associated with that site-specific action.

Concern Statement #95: The Forest Service should monitor water flows and supply to meet NFMA requirements. (56-32, 74-57, 84-63)

Response: Two items have been added to the Monitoring Plan in response to these comments. Monitoring Question #10 would track the number of water rights procured or water right filings made. Monitoring Question #11 would track surface water trends for three major streams: Oak Creek, Beaver Creek, and Fossil Creek. See chapter 5 of the Forest Plan.

Concern Statement #178: The Forest Plan should require wetlands on Anderson Mesa to be monitored for use by ducks and other wildlife. (56-99)

Response: The purpose of the monitoring plan is to evaluate, document, and report how the Forest Plan is applied, how well it works, and if its purpose and direction remain appropriate. Based upon this evaluation, recommendations may be made to the Forest Supervisor to change management direction, or revise, or amend the Forest Plan.

A desired condition for wetlands in the Forest Plan is to provide functional soil and water resources on most acres, consistent with their flood regime and flood potential and provide diverse habitats for native species. Wetlands are in or trending toward proper functioning condition. See FW-Rip-Wtlnds-DC-1.

An objective for wetlands would restore 5 to 10 wetlands currently not in proper functioning condition so that they are in, or are trending toward, proper functioning condition during each 10-year period over the life of the plan. See FW-Rip-Wtlnds-O-1.

Monitoring Question #8 asks "[H]ow much have management activities improved functional-at-risk or nonfunctional stream riparian areas and wetlands?" This question is intended to gauge progress toward desired conditions and to address any problems moving toward desired conditions.

The plan addresses wildlife use of wetlands by using the approach that if habitat is well distributed, and functioning properly (assuming sufficient precipitation), then wildlife will use the habitat where and when it needs to. Habitat that is functioning properly is the focus of the Forest Plan.

Concern Statement #207: The Forest Plan should include recreational shooting and adaptive management strategies to address problem areas in the Monitoring Plan. (56-190)

Response: The impacts specifically related to recreational shooting have not been identified as a plan-level monitoring item. Specific recreational shooting impact monitoring would be developed and implemented through project-level monitoring plans. Recreational shooting falls under Dispersed Recreation. A desired condition promotes areas used for dispersed recreation across the Forest retain their natural character to the extent possible and have minimal evidence of human waste and litter, sanitation issues, and resource damage. See FW-Rec-Disp-DC-3.

In addition, a guideline in Recreation All would require that recreational activities, locations, and/or settings be managed to have minimal user conflicts, to be in balance with the capacity of other resources

to support them, to promote public health and safety, and/or to prevent wildlife access to food, trash, and human waste. See FW-Rec-All-G-2.

Concern Statement #208: The Forest Plan should include monitoring of impacts associated with motor vehicles as part of the Monitoring Plan. (56-150, 56-181)

Response: The impacts specifically related to motor vehicles have not been identified as a plan-level monitoring item. Monitoring of motor vehicle impacts has been addressed through the travel management process. Specific motor vehicle impact monitoring will continue to be developed and implemented through project-level monitoring plans.

Concern Statement #488: The Forest Plan should require periodic monitoring of trails and areas designated for motorized use. Areas observed to have environmental damage must be closed or corrective regulations must be enforced. (56-160)

Response: No change to the Forest Plan has been made in response to this comment. The appropriate level of monitoring for routes and areas designated for motorized use is determined as part of the project-level decision to designate those routes and areas. Site-specific travel management planning will use the framework set by the Forest Plan (desired conditions, standards, guidelines) and will consider potential resource impacts, access needs, public input, and alternative views. If undesirable resource conditions resulted from motor vehicle use on designated routes or in designated areas, they could be addressed through site-specific evaluation and analysis. While the plan does not duplicate the Travel Management Rule or the directives, it is consistent with both and is meant to be used along with the directives and the motor vehicle use map.

Concern Statement #500: The Forest Service should clarify some of the monitoring questions included in the Draft Revised Plan. For monitoring question 3 in the Draft Revised Plan, because there are so many different PNVTs listed and each has a different set of desired conditions, the monitoring indicators could be summarized across all PNVTs by stating, "proportion of each PNVT in specific seral stages or plant communities; status of specific indicators (e.g., snag density or grassland cover), depending on PNVT." For monitoring question 11 in the Draft Revised Plant, the indicators would likely be number of projects accomplished, whereas for monitoring question 12, the indicators would be "change in abundance, site occupancy, or distribution for selected species" (or for MIS, if that is the extent of the population monitoring). (63-4)

Response: The Forest Plan has been adjusted in response to this comment. All of the monitoring questions included in the Monitoring Plan in chapter 5 of the Forest Plan have been reviewed. Each question now clearly states the evaluation criteria and data sources to be used to evaluate the monitoring questions. Specific indicators have been identified.

Concern Statement #372: The monitoring strategy for the Forest Plan should include questions that address invasive plants and the relationship of management actions such as thinning, prescribed fire, and grazing to changes in the occurrence of targeted invasive plant species. Suggested wording is "Has the occurrence or distribution of selected invasive plant species (i.e., bull thistle, diffuse knapweed, and cheatgrass) changed as the result of management actions?" This wording would allow for monitoring management actions to eradicate or reduce invasives, as well as actions that might increase them. The monitoring indicator would be the proportion of management sites surveyed where one or more of the selected species was observed, or you could set a threshold such that being "observed" meant it occurred across 5% or more of the management site. For this monitoring objective, the data precision could be class B, a quick ocular estimate of invasive species across a randomly selected subset of sites that have received active management in the past five years. (63-5)

Response: A monitoring question related to invasive plants has been added to the Monitoring Plan in response to this comment. See Monitoring Question #13 in chapter 5 of the Forest Plan.

Concern Statement #530: The Forest Plan should monitor how management activities influence habitat quality and quantity for the Mexican spotted owl and identify sites on the Forest that continue to be occupied through time. (86-45)

Response: The Forest Plan has been adjusted in response to this comment. The monitoring question related to Mexican spotted owl has been expanded to ask additional questions related to the condition of Mexican spotted owl habitat. See Monitoring Question #22, A through E, in the Monitoring Plan in chapter 5 of the Forest Plan. The monitoring questions identify the data sources that will be used to answer the questions.

Project-specific monitoring would be developed through individual projects.

Motorized and Non-motorized Opportunities

Concern Statement #303: The Forest Plan should include direction on motorized travel and dispersed camping opportunities to provide reasonable access to big game, fishing, wildlife viewing and a quality recreational experience. (70-5, 75-116, 89-1)

Response: Motorized access for recreational activities is addressed in several places in the Forest Plan; however, no one type of recreational activity (i.e., wildlife-based recreation) is highlighted over another. One desired condition in the Roads and Facilities sections has been adjusted to address this comment. The adjusted plan component specifically acknowledges a desire for reasonable motorized access (by road) for recreation. See FW-RdsFac-DC-1. A similar desired condition in the Trails and Trailheads section applies to motorized use on trails. See FW-Rec-Trails-DC-1. The Dispersed Recreation section contains a desired condition for motor vehicle use to occur at sustainable levels while providing opportunities for a variety of motorized use types and levels of challenge for a diversity of users. See FW-Rec-Disp-DC-2.

Specific motorized use determinations are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule. The Forest Plan includes a standard requiring motor vehicle use to occur as defined on motor vehicle use maps (MVUM), except for those uses authorized by law, permits, and orders in connection with resource management and public safety. See FW-Rec-Disp-S-1 and FW-RdsFac-S-1.

Concern Statement #306: The Forest Plan should acknowledge the importance of motorized travel for wildlife management, wildlife associated recreation, and associated benefits. (75-110)

Response: The Dispersed Recreation section has been adjusted in response to this comment. Hunting, fishing, and motorized vehicle recreation are listed as some of the more common dispersed recreation activities on the Forest in the General Description and Background section for Dispersed Recreation. Furthermore, a desired condition in Roads and Facilities describes the forest transportation system and specifically mentions wildlife management. FW-RdsFac-DC-1 states:

> The transportation system (roads) provides reasonable motorized access to the public, city, county, State, and other Federal entities for permissible uses such as recreation, fire management, wildlife management, and access to infrastructure or neighboring land. The transportation system expands and contracts commensurate with use and needs, and it balances the desire for access with management activities and ecological impacts. An economical system of sustainable, well maintained, and marked roads provides diverse opportunities to explore the forest while protecting watershed conditions, recreation opportunities, scenery, heritage resources, rare plants, fisheries, and wildlife habitat and

movement. However, the transportation system does not necessarily provide for user comfort or all-weather access on all roads.

Concern Statement #6: The Forest Service should provide off-road motorized recreation opportunities in the southern and central part of the forest. (4-3)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not designate specific areas for off-road motorized recreation. Specific motorized use determinations would be done through future project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Specific recreation planning efforts will use the framework set by the Forest Plan (such as desired conditions, standards, guidelines, and suitability determinations) and will consider potential resource impacts, access needs, public input, and alternative views.

Concern Statement #302: The Forest Plan should close trails and areas to motor vehicles unless they are determined to be appropriate for their use through completion of an analysis, review, and implementation process, and are officially posted with signs as being open. (56-159)

Response: Specific motorized use determinations are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule. In general, motor vehicle use is only authorized on routes and areas identified on the motor vehicle use map that is developed as part of the travel management process. The Forest Plan includes a standard requiring motor vehicle use to occur as defined on motor vehicle use maps (MVUM), except for those uses authorized by law, permits, and orders in connection with resource management and public safety. See FW-Rec-Disp-S-1 and FW-RdsFac-S-1.

Concern Statement #10: The Forest Plan should explain how road closures will be enforced and illegal trail builders will be penalized. (5-9, 40-2, 46-151, 87-3)

Response: No change has been made to the Forest Plan in response to this comment. Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect.

Concern Statement #107: The Forest Service should carry forward plan components to monitor off-road driving and to raise awareness to damage that can be caused by off-road driving. (56-22, 84-51)

Response: The suggested language from the 1987 Forest Plan is no longer necessary because off-road driving is now generally only allowed in the Cinder Hills OHV area. The suggested language addressed concerns that existed prior to implementation of the Travel Management Rule when cross-country travel by motorized vehicles was allowed. Nonetheless, the revised Plan is not silent on off-road driving. Standards in the Roads and Facilities and Dispersed Recreation sections require motor vehicle use to occur on the designated system of roads, trails and areas, with limited exceptions. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1. Other plan components also address motorized recreation. See FW-Rec-Disp-DC-2, FW-Rec-Disp-G-1, and FW-Rec-Disp-Management Approaches, which state:

- Establish long-term partnerships with recreation organizations to help plan, construct, and maintain motorized and non-motorized recreation opportunities and foster a low-impact conservation ethic.
- Develop management plans and/or strategies through collaborative efforts for specific dispersed recreation activities and/or locations to addresses user needs, visitor safety, and resource protection.

Activities or locations could include motorized recreation for Cinder Hills OHV Area, rock climbing at the Oak Creek Vista, and mountain biking around Sedona.

- Coordinate with city, county, State, and other agencies to manage motorized recreation and reduce cross-boundary conflicts.

The Forest Plan contains many components that are designed to educate users of the Coconino NF about the resources on the Forest and the ethical use of those resources. These components have been combined into the Interpretation and Education section. These plan components provide direction to inform Forest users about sustainable uses and practices on the Forest.

Concern Statement #118: The Forest Service should close and decommission off-highway vehicle trails that cross streams, streambeds, or streambanks, or are near damaged riparian or aquatic ecosystems. (56-21, 84-50)

Response: The Forest is not making site-specific decisions, such as the closure or decommissioning of specific trails, in the Forest Plan. Appropriate routes for off-highway vehicle use have been and continue to be addressed through the Travel Management Rule (TMR) process, which makes decisions on road and trail use based on site-specific information. Since the implementation of the TMR on the Forest, cross-country motorized travel has been generally prohibited.

The Forest Plan contains direction that will guide future decisions related to the concern expressed in this comment. A comprehensive set of desired conditions and other plan components are included in the Riparian Areas section of the Forest Plan. See the FW-Rip-All, FW-Rip-Strm, FW-Rip-Wtlnds, FW-Rip-Spr, and FW-Rip-RipType sections in chapter 2 of the Forest Plan. Plan components in the Recreation section require consideration of the desired conditions for other resources, including riparian and aquatic ecosystems, and provide other guidance designed to protect resources from potential impacts from motorized recreation. See FW-Rec-All-DC-6, FW-Rec-All-G-1 and 2, FW-Rec-Disp-DC-2 and 3, FW-Rec-Disp-S-1, and FW-Rec-Disp-G-1.

Concern Statement #119: The Forest Plan should restrict motor vehicles from crossing riparian areas, streams, and rivers for big game retrieval, except at hardened crossings or crossings with existing culverts. (75-128)

Response: The Forest is not making site-specific decisions, such as where motorized big game retrieval is being allowed, in the Forest Plan. Appropriate areas for motorized big game retrieval have been and continue to be addressed through the Travel Management Rule (TMR) process, which makes decisions on road, trail, and off-road use based on site-specific information.

The Forest Plan contains direction that will guide future decisions related to the concern expressed in this comment. A comprehensive set of desired conditions and other plan components are included in the Riparian Areas section (which includes streams) of the Forest Plan. See FW-Rip-All, FW-Rip-Strm, FW-Rip-Wtlnds, FW-Rip-Spr, and FW-Rip-RipType in chapter 2 of the Forest Plan. Plan components in the Recreation section require consideration of the desired conditions for other resources, including riparian and aquatic ecosystems, and provide other guidance designed to protect resources from potential impacts from motorized recreation. See FW-Rec-All-DC-6, FW-Rec-All-G-1 and 2, FW-Rec-Disp-DC-2 and 3, FW-Rec-Disp-S-1, and FW-Rec-Disp-G-1.

Concern Statement #137: The Forest Service should not have an objective to add any motorized trails because there has been inadequate monitoring, enforcement, and education and signage related to motorized recreation. Designated trails can lead to new social trails which can impact adjacent natural areas. (56-155)

Response: The Trails and Trailheads objective neither requires nor prohibits new motorized trails, but new motorized trails would be a possibility under the Forest Plan. See FW-Rec-Trails-O-1. Decisions on whether to add new motorized trails will be based on a site-specific evaluation and guided by many plan components. For example, a desired condition in the Trails section expresses a desire for a system of well-marked and well-maintained sustainable trails. See FW-Rec-Trails-DC-1.

The Forest Plan includes a comprehensive monitoring strategy that is designed to evaluate, document, and report how the Forest Plan is applied, how well it works, and if its purpose and direction remain appropriate. This monitoring is generally conducted at the geographic scale of the Forest. Where to authorize motorized used and the appropriate level of monitoring for routes and areas designated for motorized use is determined as part of the project-level decision to designate those routes and areas. Site-specific travel management planning will use the framework set by the Forest Plan (desired conditions, standards, guidelines) and will consider potential resource impacts, access needs, public input, and alternative views. Enforcement of use on motorized trails is not a Forest Plan component but is a requirement of the Agency, regardless of the land management plan in effect.

The Forest Plan also provides direction on education and signage. One of the guidelines in the Roads and Facilities section has been expanded to require signage that facilitates navigation of designated motorized routes and prevents motorized use outside of designated areas and routes. See FW-RdsFac-G-3.

Additional direction is located in the Interpretation and Education section. A desired condition in this section creates an express goal to provide forest visitors with properly placed, clearly worded signs and information on authorized motorized use and restrictions. See FW-InterpEd-DC-5. A guideline in this section directs designated trail uses (e.g., motorized, mechanized, equestrian, etc.) to be identified at trailheads to reduce user conflicts, and impacts to trails and associated resources. See FW-InterpEd-G-3. Finally, a management approach is included in the Interpretation and Education section to remind forest managers to work with others to establish interpretive messages and programs for designated motorized routes and areas. It states:

> Work with agencies, motorized recreation user groups, and other stakeholders to establish interpretive messages and programs for designated motorized routes and areas. These efforts may include improved signs, information kiosks, and other interpretive tools. Interpretive themes may include messages to foster conservation ethics, to prevent lost riders, to show opportunities of where to ride, to identify dangerous and/or closed areas, to teach riding ethics, and to reduce user conflicts.

The Forest Plan addresses the problem of unplanned user-created trails in a number of plan components. First, the Forest Plan seeks to create a recreation environment that eliminates the urge for users to create unplanned trails. This recreation environment involves providing a trail system that meets users' needs and expectations and educating users about the potential impacts associate with off trail use. Plan components addressing the Forest's desire to meet trail users' needs and expectations can be found in FW-Rec-All-DC-4 and 6, FW-Rec-Trails-DC-1, 2, and 3, and FW-Rec-Trails-G-1. Plan components addressing educating trail users can be found in FW-InterpEd-DC-1 through 5, and FW-InterpEd-G-1, 2, and 3. A management approach in the Interpretation and Education section reminds forest managers to share Leave No Trace and Tread Lightly concepts and practices in forest interpretation and visitor education. The Forest's overall goal on this topic is summed up in a desired condition in the Trails section that notes that trail use remains on trails and unplanned, user-created trails are rare. See FW-Rec-Trails-DC-11.

Second, the Forest Plan provides guidance on how to address unplanned, user-created trails. A Trails guideline requires unplanned, user-created trails to be managed to prevent future access and to be rehabilitated to accelerate recovery and to prevent further resource impacts. See FW-Rec-Trails-G-3. A

standard in the Special Uses section requires permit holders to rehabilitate unplanned, user-created trails that were not authorized under their special use permit. See FW-SpecUse-S-2. Finally, a guideline in the Heritage section requires that unplanned user-created trails leading to archaeological sites be eliminated. See FW-Hrtg-G-4.

Finally, a Trails and Trailheads guideline requires these facilities to be designed, built, rerouted, or maintained to prevent conflicts with neighboring lands and address impacts to other resources. See FW-Rec-Trails-G-1. If motor vehicle use on designated routes or in designated areas begins leading toward new social trails, they would be addressed through site-specific evaluation and analysis.

Concern Statement #143: The Forest Plan should include plan components that prohibit the use of lead ammunition and restrict areas available for recreational shooting to reduce lead contamination of soil resulting from recreational shooting with lead shot and motorized recreation, which can lose lead wheel balancing weights on the forest. (56-185, 56-188, 56-192)

Response: Recreational shooting is currently not permitted on about 11 percent of the Forest under existing law and policy. This law and policy is not repeated in the revised forest plan. The Forest Plan was not specifically modified to include plan components that prohibit lead ammunition nor does it specifically restrict areas available for recreational shooting.

Instead, the Forest Plan includes strategic direction on soil and water health that would be applicable if lead from these activities rose to levels that were impacting forest resources or became a concern from a public health and safety standpoint. For example, a Soil desired condition in the Forest Plan states that "Soil productivity and functions are sustained and functioning properly within the capability of the site…." See FW-Soil-DC-2. Likewise, a Watersheds and Water desired conditions states "Water quality meets or exceeds Arizona water quality standards…." See FW-Water-DC-7. One or both of these desired conditions could be used to address a specific change in a specific area if recreational shooting or motorized recreation were impacting these desired conditions. A guideline in the All Recreation section states that "Recreational activities, locations, and/or settings should be managed to have minimal user conflicts, to be in balance with the capacity of other resources to support them, to promote public health and safety…." See FW-Rec-All-G-2.

In addition, a desired condition in Interpretation and Education incorporates lead reduction as part of the land ethic that is emphasized in messages to the public. See FW-InterpEd-DC-1.

Concern Statement #180: The Forest Plan should include direction to discourage or prohibit new motorized trails. (110-1, 157-1, 776-1)

Response: The Forest Plan proposes to manage trails to provide a variety of opportunities, including motorized use. See FW-Rec-Trails-DC-1 and 2. Decisions on where to allow motorized use are guided by the Forest Plan, but are made at the project level based on site-specific information and analysis. An absolute prohibition on additional motorized trails is not included in the Forest Plan. The Forest Plan includes direction for motorized recreation management and the potential impacts associated with motorized recreation. See FW-Rec-Disp-DC-1, 2, and 3, FW-Rec-Disp-S-1, and FW-Rec-Disp-G-1.

Concern Statement #294: The Forest Plan should include a standard prohibiting off-road vehicle use where it is negatively impacting rare plants and animals, Forest Planning species, and Forest Service sensitive species, such as "Off-road vehicle use shall be prohibited where Forest Service sensitive species occur." This recommendation is being made because all of these same species are impacted by stressors that are out of the Forest's control (e.g., drought, climate change, stochastic events, border patrol activities) and motorized vehicle use is something the Forest Service should be managing to protect species diversity. (56-179)

Response: The Forest Plan includes a standard that requires motor vehicle use to occur on the designated system of roads, trails, and areas, as defined on motor vehicle use maps. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1. Adjustments to the motor vehicle use maps would be considered in future project-level decisions, including implementation of the Travel Management Rule (36 CFR §212) for the Forest. Impacts or potential impacts to sensitive species would be considered and addressed based on site-specific information.

Concern Statement #304: Desired condition 13 in the dispersed recreation section of the Forest Plan should be modified to address demand for dispersed camping opportunities. The recommended modification is: "Dispersed camping and parking is allowed across the broadest possible array of forest lands to accommodate a variety of uses and experiences and avoid unsafe camping conditions in close proximity to roads." (75-114)

Response: This desired condition has been adjusted in response to this comment. The portion of the plan component that suggested dispersed camping with recreational vehicles would occur in designated corridors has been removed because it is redundant of existing regulation and policy related to motorized activities. The desired condition acknowledges that a range of choices for both motorized and non-motorized dispersed camping is desirable. See FW-Rec-Disp-DC-4. Motor vehicle use, including motor vehicle use associated with dispersed camping, is addressed in another desired condition, which seeks to provide opportunities for a variety of motorized use types at sustainable levels. See FW-Rec-Disp-DC-2.

Concern Statement #305: The Forest Plan should allow dispersed camping and parking at all sites showing an established history of use. (59-7, 75-121)

Response: The Forest Plan does not authorize or mandate any site-specific projects or activities; therefore it cannot authorize camping or parking as requested in the comment. Specific motorized use determinations are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule. The Forest Plan contains plan components that will help guide decisions on dispersed camping and parking. See FW-Rec-Disp-DC-2 and 4, MA-LongV-DC-2 and 3, and management approaches in the Dispersed Recreation section, which state:

> Establish long-term partnerships with recreation organizations to help plan, construct, and maintain motorized and non-motorized recreation opportunities and foster a low impact conservation ethic.
>
> Coordinate with city, county, State, and other agencies to manage motorized recreation and reduce cross-boundary conflicts.

Concern Statement #438: The Forest Plan should include a management approach that limits consideration of additional trail routes only if absolutely necessary. This includes considering the identification of possible single-use trails, as no non-motorized visitors wish to share trails with noisy, stinky speeding dirt bikes, quads, etc. (56-166)

Response: No change has been made to the Forest Plan in response to this comment. The Trails section includes a desired condition stating a goal that multi-use trails are more common than single-use trails. See FW-Rec-Trails-DC-5. This will guide future trails projects to co-locate user groups when appropriate. A management approach in the Trails section also reminds forest managers that multi-use trails are preferred over single-use trails. It states:

> In general, multi-use trails are preferred, though single-use trails may be considered where trail design features cannot be provided to mitigate user conflicts or provide for a sustainable recreation settings between multi-use types.

Concern Statement #439: The Forest Service should adjust the analysis in the environment impact statement related to the consideration of single-use trails. (56-169)

Response: No change has been made in response to this comment. The Forest Plan includes components that will guide decisions on how to manage trail use to address user conflicts and allow for the establishment of single-use trails when necessary. Although one of the desired conditions of the Forest Plan is for multi-use trails to be more common than single-use trails (see FW-Rec-Trails-DC-5), a Trails and Trailheads management approach reminds forest managers that even though multi-use trails are preferred:

> …single-use trails may be considered where trail design cannot mitigate user conflicts or provide for sustainable recreation settings between multi-use types.

Several plan components address management of conflicts between recreational users, including trail users. In general, minimal user conflicts are a desired condition. See FW-Rec-All-DC-6. An All Recreation guideline directs recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. An objective in the Trails section of the Forest Plan provides for the development or modification of 2 to 8 systems of trails to adequately provide for varying user groups and to reduce conflicts between user groups. See FW-Rec-Trails-O-1. To reduce user conflicts, an Interpretation and Education guideline directs interpretive information to be available at trailheads identifying the types of uses that have been designated for the trail. See FW-InterpEd-G-3. All of these components would guide future management decisions on how to minimize user conflicts, if they exist, and allow single-use trails to be an option to address the conflict.

Concern Statement #441: The Forest Plan should retain the management approach in the Dispersed Recreation section of the Draft Revised Plan that suggests when forest managers should consider single-use trails. (67-7)

Response: This management approach has been retained and moved to the new Trails and Trailheads section of the Forest Plan. It has been slightly modified to remind forest managers that multi-use trails are preferred, while recognizing that single-use trails may be appropriate in certain circumstances. It states:

> In general, multi-use trails are preferred, though single-use trails may be considered where trail design features cannot be provided to mitigate user conflicts or provide for sustainable recreation settings between multi-use types.

Concern Statement #654: The Forest Plan should encourage adding more motorized single-track (motorcycle) trails on the Forest. (106-1)

Response: The Forest Plan proposes to manage trails to provide a variety of opportunities, including motorized use. See FW-Rec-Trails-DC-1 and 2. Decisions on where to allow motorized use are guided by the Forest Plan, but are made at the project level based on site-specific information and analysis. These decisions will be guided by several components in the Forest Plan. Having a variety of trail types and levels of challenge for a diversity of users within a variety of settings is a Trails desired condition. See FW-Rec-Trails-DC-2. For motorized recreation opportunities in particular, it is a desired condition for trails to provide various challenge levels and to be available for off-highway-vehicle touring. See FW-Rec-Trails-DC-7. A Trails and Trailheads desired condition indicates a preference for multi-use trails over single-use trails. See FW-Rec-Trails-DC-5. However, a Trails and Trailheads management approach reminds forest managers that even though multi-use trails are preferred:

> …single-use trails may be considered where trail design cannot mitigate user conflicts or provide for sustainable recreation settings between multi-use types.

Concern Statement #448: The Forest Plan should include a desired condition in the Dispersed Recreation section that states: "Motorized access accounts for the needs of wildlife management, the economy, and interests of affected governments and private businesses of cooperation with the Arizona Game and Fish Department, County Government and representatives from a broad array of recreational and multiple use user groups." (75-11)

Response: The Forest Plan has been adjusted to address the concerns in this comment. The desired condition regarding the Forest's transportation system has been expanded to recognize the various users that need motorized access on the Forest (including city, county, State, and other Federal entities) and some of the reasons that they need motorized access (including wildlife management). See RW-RdsFac-DC-1.

Concern Statement #450: The Forest Plan should include a standard limiting use of vehicles below a decibel range of 96 to protect quiet recreation opportunities and wildlife. (56-178)

Response: No change has been made to the Forest Plan in response to this comment. This concern is already partially addressed by an existing law and regulation. Arizona state law requires off highway vehicle equipment to be equipped with "either a muffler or other noise dissipative device that prevents sound above ninety-six decibels. See Arizona Revised Statute section 28-1179A.3. Forest Service regulation prohibits the off road operation of any vehicle in violation of any applicable noise emission standard established by a state agency. See 36 CFR 219.15(d).

Although the Forest Plan does not include specific restrictions on sound associated with vehicles, this concern could be addressed through travel management planning and other project-level decisions. Several plan components provide guidance related to potential impacts from motor vehicles associated with sound. One plan component expressly mentions the desire for natural soundscapes that are consistent with ROS objectives. See FW-Rec-All DC-10. A Recreation guideline directs recreational activities to be managed to have minimal user conflicts. See FW-Rec-All-G-2.

Concern Statement #577: The Forest Service should develop a comprehensive non-motorized trails plan. (72-2)

Response: Conducting a comprehensive non-motorized trail planning effort that evaluates the propriety and effectiveness of existing trails and identifies new trail routes is outside of the scope of the Forest Plan. The Forest Plan contains plan components that would guide such an effort. For example, the Trails section contains a desired condition for a system of well-marked and well-maintained trails that are planned and designed to be harmonious with neighboring lands and trail systems through logical connections that expand recreational opportunities. See FW-Rec-Trails-DC-1. A management approach in the Trails and Trailheads section reminds forest managers to:

> Collaborate with county and city trails coordinators, local groups, and area residents, when conducting trail planning. Consider needs for non-motorized and motorized trails and provide opportunities for both.

Concern Statement #585: The Forest Plan should clarify that trail density will be measured in a qualitative site-specific analysis. (72-6)

Response: The Dispersed Recreation guideline that addressed trail density (FW-Rec-Disp-G-13) was in advertently included in the draft plan. An errata circulated with the draft plan noted that the guideline should be deleted. The Forest Plan does not include express direction on trail density and how it should be measured. The Forest Plan provides direction for a system of sustainable trails that provide a variety of settings and challenges for visitors. See FW-Rec-Trails-DC-1 and 2. The Forest Plan also direction for trails to be designed to address, among other things, impacts to resources and user experience. See FW-

Rec-Trails-G-1. Trail density, measured qualitatively or quantitatively, is one tool that may be used at the project level to determine if desired conditions are being maintained or moved toward.

Concern Statement #588: The Forest Plan should recognize that increases in motorized activity can be contrary to the natural environment that all non-motorized visitors seek. (56-162)

Response: The Forest Plan acknowledges the potential for conflict between recreational user groups. User conflicts are addressed in several plan components. Minimal user conflict is an All Recreation desired condition in the forestwide Recreation section. See FW-Rec-All-DC-6. A guideline in the same section of the Forest Plan requires recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. A modified Trails and Trailheads guideline in the forestwide Recreation section effectively addresses the potential for motorized and non-motorized user conflicts by requiring user experience to be considered when trails are being designed or re-routed. See FW-Rec-Trails-G-1.

Concern Statement #615: The Forest Plan should direct conflicts with non-motorized recreationists to be minimized when developing motorized trails. (56-199)

Response: The Forest Plan has been adjusted in response to this comment. The management approach from the Dispersed Recreation section mentioned in the comment has been removed from the Forest Plan. User conflicts are adequately addressed in several plan components. Minimal user conflict is a desired condition in the All Recreation section. See FW-Rec-All-DC-6. A guideline in the same section of the Forest Plan requires recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. A modified guideline in the Trails and Trailheads section effectively addresses the potential for motorized and non-motorized user conflicts by requiring user experience to be considered when trails are being designed or re-routed. See FW-Rec-Trails-G-1.

Concern Statement #15: The Forest Service should support a trail system in the Beaver Creek area to address the environmental, recreational, and economic needs of the area. (6-1, 89-2, 99-12, 107-1)

Response: Approving the development of a trail system in the Beaver Creek area, or any other specific area on the Forest is a project-level decision that would be made based on site-specific information and analysis, and therefore, not a forest plan level decision.

While the Forest Plan does not specifically provide a statement of support for a trail system in the Beaver Creek area, it has been adjusted to provide additional guidance that could facilitate the development of a trail system in this area. Desired conditions have been added to the Verde Valley Management Area that guide trail system design. See MA-VerdeV-DC-2 and 3. Also, several management approaches have been added to the Verde Valley Management Area to remind forest managers to:

> Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trail head planning and construction efforts.
>
> Work with stakeholders to develop collaborative solutions to problems that arise from high use recreation.
>
> Collaborate with the Montezuma Castle National Monument Staff to better meet visitor needs and protect resources in the vicinity of Montezuma Castle and Montezuma Well.

Collaborate with Arizona State Parks to better meet visitor needs and protect resources in the vicinity of Deadhorse State Park.

Concern Statement #283 The Forest Plan should include a standard establishing capacity limits in areas where resource damage and negative impacts to surrounding lands are occurring, such as Cinder Hills OHV Area. Capacity is never mentioned in regards to motorized recreation, though the following Desired Condition is given for Dispersed Recreation:

> **Growing demand for recreation is balanced with other forest desired conditions, unless increasing capacity results in unacceptable negative effects on natural resources. (see Draft Revised Plan, FW-Rec-Disp-DC-2)**

Because resource damage is currently occurring in the Forest, capacity based systems should be considered if other methods are not effective at reigning in impacts. The Forest Service should establish a guideline and management approach to achieve the Desired Condition concerning capacity limits. (56-152)

Response: The Forest Plan is, by design, strategic in nature and does not identify specific motorized recreation capacity limits for the Forest or individual areas within the Forest. Setting specific motorized recreation capacity limits for any area in the Forest is a project-level decision that would be made based on site-specific information and analysis, and therefore, not a forest plan level decision. However, the Forest Plan does contain a desired condition for motorized vehicle use to occur at sustainable levels. See FW-Rec-Disp-DC-2. Any future proposed project or activity would need to be consistent with this desired condition.

In support of the project-level decisions, a forestwide desired condition promotes recreation opportunities that are balanced with the capacity of the Forest resources to support them, with minimal user and resource conflicts. See FW-Rec-All-DC-6 and FW-Rec-All-G-2. The Forest Plan also contains a desired condition and a guideline intended to protect areas outside the Cinder Hills OHV area and the Sunset Crater Volcano National Monument. See MA-VolcanWd-DC-3 and MA-VolcanWd-G-1. A standard in Red Rock Management Area would restrict the permitting of new outfitter-guide permits in areas that are at or approaching capacity. See MA-RedRock-S-5.

Concern Statement #451: The Forest Plan should include a guideline that requires signage for the boundary of the Cinder Hills OHV area. (75-113)

Response: The Forest Plan has been adjusted in response to this comment. A guideline has been added to the Dispersed Recreation section requiring all designated areas and routes, boundaries, and routes to be clearly and uniformly identified. See FW-Rec-Disp-G-1. The guideline was not focused on the Cinder Hills OHV area because motorized use outside of designated areas or routes could be problematic anywhere on the Forest. The Forest Plan continues to make clear identification of the boundaries of the Cinder Hills OHV Area a desired condition. See MA-VolcanWD-DC-3.

Concern Statement #329: The Forest Plan should include a standard to close the gates on both the Mount Elden and Schultz Pass roads to prevent motor vehicles from transporting mountain bikers to top of the Mount Elden trail system. (27-4, 56-87)

Response: The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. It does not contain project and activity decisions such as permitting or prohibiting occupancy, use or access. However, the Forest Plan does include direction related to recreational access and user conflicts that will guide project and activity decisions in the future. For example, desired conditions related to recreational access can be found in the All Recreation and Roads and Facilities

sections of the Forest Plan. See FW-Rec-All-DC-2, 4 and FW-RdsFac-DC-1. Plan components related to user conflicts can be found in the All Recreation section. See FW-Rec-All-DC-4, 6 and FW-Rec-All-G-2.

Decisions to close or restrict access on the Coconino NF are determined during travel management planning. Public access determined by this process is guided by the motor vehicle use map. As part of this process, we identify the road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.

Concern Statement #452: The Forest Plan should include direction to reduce motorized vehicle encroachment on the Observatory Mesa Natural Area. (78-7)

Response: The Forest Plan contains guidance that addresses the motor vehicle encroachment. This guidance would be applied by any project-level decisions addressing motorized access near the Observatory Mesa Natural Area. It is a desired condition for motorized vehicle use to occur as identified on the motor vehicle use map. See FW-Rec-Disp-DC-2. Standards required motor vehicle use to occur on the designated system of roads, trails, and areas as defined on motor vehicle use maps. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1. Guidelines require roads to be clearly marked to facilitate navigation of designated motorized routes and to prevent motorized use outside of designated areas and routes. See FW-RdsFac-G-3 and FW-Rec-Disp-G-1. Finally, a management approach has been added to the Dispersed Recreation section to remind forest managers to coordinate on motorized recreation management to reduce cross-boundary conflicts. It states:

> Coordinate with city, county, State, and other agencies to manage motorized recreation and reduce cross-boundary conflicts.

A reference to the Observatory Mesa Natural Area has been added to the General Description and Background for the Flagstaff Neighborwood Management Area.

Concern Statement #625: The General Description and Background for the Walnut Canyon Management Area in the Forest Plan should be adjusted. The statement that the "areas south and east of Walnut Canyon provide more remote dispersed recreation opportunities including motorized travelways" is contradictory because recreationists seeking remote dispersed recreation opportunities seek to avoid motorized travelways. (56-97)

Response: It is understandable that recreationists have different beliefs about what constitutes dispersed recreation. For purposes of the Forest Plan, dispersed recreation includes both non-motorized and motorized recreation. As described in the General Description and Background section for Dispersed Recreation:

> Dispersed recreation consists of activities that take place in less improved settings, outside of or disconnected from developed or concessionaire-operated facilities.

The Glossary includes the following definition for dispersed recreation:

> The type of outdoor recreation that tends to be spread out over the land and in conjunction with roads, trails, and undeveloped waterways. Activities are often day-use oriented and include hunting, fishing, boating, hiking, off-road vehicle use, cross-country skiing, mountain biking, and rock climbing.

Accordingly, motorized recreation does not conflict with the Forest Plan's definition of dispersed recreation.

Concern Statement #657: The Forest Service should add the acres that are available for motorized use (not in the wildlife context) by alternative as an indicator to Topic #9 in the Comparison of Alternatives table in chapter 2 of the Draft Environmental Impact Statement (table 1), which considers the potential for motor vehicle traffic to impact wildlife that reflects. (75-141)

Response: Including an indicator regarding motorized use that is not in the wildlife context would not be useful in comparing the alternatives on this topic related to impacts to wildlife. Therefore, the requested indicator has not been added to this topic.

However, in response to this request for additional information on the availability of motorized use, the Summary of Effects table in chapter 2 has been adjusted to include a section on the Motorized Transportation System. This section provides information on the number of miles of road that are currently open for public and administrative and permitted use. The table has also been adjusted to include information on how semi-primitive non-motorized and primitive recreation opportunity spectrum classifications and special area designations could impact the availability of the current road system. This information is simply a summary of the information that is included in the Infrastructure and Facilities section in chapter 3 of the environmental impact statement and the Infrastructure Specialist Report (USDA Forest Service 2015b), which can be consulted for additional detail on this topic. Acres of motorized use was not used as a measure. Since the implementation of the Travel Management Rule, motorized travel on the Forest has generally been limited to designated routes. Cross-country motorized travel can occur in the Cinder Hills OHV area, the camping corridors identified on the Coconino NF motor vehicle use map, and areas where motorized big game retrieval has been authorized. Cross-country travel can also be authorized by permit and can occur for administrative use. Because much of this cross-country travel would be situational, it would be very difficult to quantify the acres that are available for motorized use.

Concern Statement #659: The Forest Plan should ensure that any new off-road vehicle areas are few, small, and well-confined. (30-1)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not decide whether to establish any new off-road vehicle areas. The Forest Plan provides the framework that would guide site-specific considerations of new off-road vehicle areas should they occur in the future. The Forest Plan provides desired conditions for the full array of ecological resources on the Forest. The All Recreation section includes a guideline that requires recreational activities, locations, and/or settings to be designed and managed to maintain or move toward the desired conditions for these other resources. See FW-Rec-All-G-1.

Concern Statement #440: The desired condition in the Dispersed Recreation section of the Forest Plan that addresses snowplay activities that occur where conflict exists between motorized and non-motorized activities (see Draft Revised Plan, FW-Rec-Disp-DC-20) is inadequate and unclear. This desired condition should be changed to reflect the requirement in the Travel Management Rule that the Coconino National Forest designate a system of motorized winter routes (snowmobile routes) that comply with the Executive Orders upon which the Travel Management Rule is based. See 36 C.F.R 212.8 (known as "Subpart C" of the Travel Management Rule). (56-154)

Response: As the comment notes, the Travel Management Rule already requires the Forest to designate a system of motorized winter routes. This existing requirement is not being repeated in the Forest Plan, however, the Travel Management Rule is listed in the Dispersed Recreation section of appendix D of the Forest Plan and referenced in the section titled Recreation and Transportation Suitability.

This component has been adjusted in response to this comment. Restated as a guideline, this component requires potential conflicts between motorized and non-motorized users to be considered when locating and managing dispersed winter recreation and snowplay activities. See FW-Rec-Disp-G-4.

Concern Statement #453: The Forest Plan should add snowmobiles to the standard that restricts motor vehicles to the designated system of roads, trails, and areas, as defined on motor vehicle use maps. (56-156)

Response: No change has been made in response to this comment. This concern has already been addressed by the Forest in another manner. Use by over-snow vehicles is regulated by 36 CFR § 212 Subpart C. As required by this subpart of the Travel Management Rule, in January 2017 the Forest designated the roads, trails, and areas where there is adequate snowfall to support over-snow vehicle use. An Over-Snow Vehicle Use Map (OSVUM) was created to identify those designated roads, trails, and areas. Under the Travel Management Rule, over-snow vehicle use is restricted to these designated roads, trails, and areas.

Concern Statement #693: The Forest Service should analyze the impacts of snowmobile use in designated Wilderness and Wild and Scenic Rivers. (86-63)

Response: As a motorized activity, snowmobile use is prohibited in designated wilderness areas and areas designated as wild in the Wild and Scenic River system. The Forest Plan endeavors to not repeat existing law regulation, and policy. Because no alternative proposes anything contrary to that prohibition, there would be no difference between the alternatives to disclose. Through the preliminary work on this forest plan revision effort, snowmobiling in designated wilderness and Wild and Scenic Rivers was not identified as an issue under current management. For these reasons, snowmobile use in designated wilderness and Wild and Scenic Rivers was not analyzed in the environmental impact statement.

Concern Statement #697: The Forest Service should review and clarify Topic #9 in table 1 in the Draft Environmental Impact Statement. Indicator A (the wildlife element) should be removed because it is vague and presumes a cause-effect relationship that is not supported or documented in the environmental impact statement. (75-140)

Response: The environmental impact statement has been adjusted in response to this comment. Topic #9 in table 1 of the Draft Environmental Impact Statement is based on one of the Wildlife and Ecosystem Issues mentioned in chapter 1. The Forest reviewed the comment letters that raised this issue and determined that the intended issue was related to potential motor vehicle traffic impacts to wildlife, not potential motor vehicle noise impacts to wildlife. Both the reference to this issue in chapter 1 of the environmental impact statement and the information associated with this issue in table 1 have been adjusted to state that the issue is the potential motor vehicle traffic impacts to wildlife rather than just the potential impacts limited to motor vehicle noise. This issue appears as Topic #11 in table 1 of the Final Environmental Impact Statement.

The two indicators used to compare how the alternatives address this topic have been slightly adjusted. Indicator A looks at plan language that addresses motor vehicle traffic and associated impacts to wildlife. Indicator B looks at opportunities (in acres) for areas not disturbed or less disturbed by motor vehicle traffic.

The Wildlife, Fish, and Plants section in chapter 3 of the environmental impact statement identifies the species or species groups that can be impacted by motor vehicle traffic. This section has also been updated to discuss the impact of motor vehicle traffic on these particular wildlife species or species groups based on review of scientific literature on the topic.

Concern Statement #700: The Forest Service should not allow the use of motorized and mechanized activities, including snowmobiling, in recommended wilderness areas because motorized and mechanized transport are prohibited in designated wilderness areas and can severely degrade wilderness character. (86-62)

Response: No changes to the Forest Plan were made in response to this comment. None of the alternatives would authorize motorized or mechanized transport in a designated wilderness area. Specific motorized use determinations are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule. In general, motor vehicle use is only authorized on routes and areas identified on the motor vehicle use map that is developed as part of the travel management process. The Forest Plan includes a standard requiring motor vehicle use to occur on the designated system of roads, trails, and areas, as defined on motor vehicle use maps. See FW-Rec-Disp-S-1 and FW-RdsFac-S-1. Alternative B (modified) contains no recommended wilderness areas with roads that are currently on the motor vehicle use map. Alternative C contains six recommended wilderness areas with a total of 10.6 miles of road that are currently on the motor vehicle use map.

To protect wilderness area characteristics in recommended wilderness areas, the Recommended Wilderness section includes a desired condition to maintain and enhance primitive and undeveloped characteristics. See SA-RWild-DC-1. A guideline in the Recommended Wilderness section restricts motor vehicle use to limited administrative and permitted activities that are consistent with the area's wilderness character. See SA-RWild-G-3. Furthermore, the Recommended Wilderness section includes a desired condition that mechanized recreation occur at levels that maintain and do not detract from wilderness values. See SA-RWild-DC-6. These plan components will guide management of authorized motorized and mechanized activities in recommended wilderness areas and ensure that these areas retain their primitive and undeveloped character.

Concern Statement #702: The Forest Service should not use the presence or absence of snowmobile use opportunities as an indicator because the Coconino NF receives minimal recreational snowmobile use. (75-138)

Response: No change was made in response to this comment. The topic is "Presence or absence of snowmobile use opportunities," [emphasis added] not "snowmobile use." As the indicator for this topic suggests, the point of the topic is to demonstrate how the alternatives could impact opportunities for snowmobile use by listing the acreage and areas where snowmobile use may be restricted. While snowmobile use may be low on the Coconino NF, this topic demonstrates how well the alternatives provide winter recreation opportunities with reduced noise disturbance when winter conditions accommodate both motorized and non-motorized recreation.

Concern Statement #655: The Forest Service should not apply motorized Recreation Opportunity Spectrum (ROS) classes to Arizona State Trust land. (62-1)

Response: The modeling process to determine the Recreational Opportunity Spectrum of the National Forest System land within the Coconino NF considered neighboring non-National Forest System land. This modeling effort was not intended to authorize motorized activity on the neighboring land. To remove the appearance that the Forest Service is applying ROS classes to non-National Forest System land, the ROS map in the Forest Plan has been adjusted and it no longer displays any ROS class on non-National Forest System land. See Map 12.

Recreation

Concern Statement #252: The Forest Service should review the plan components in the Developed Recreation and Dispersed Recreation sections and determine if they provide direction applicable to both sections. (56-144)

Response: All of the plan components in the Recreation section were reviewed in response to this comment. In acknowledgement that some of the direction contained in Dispersed Recreation subsection may also apply to the Developed Recreation subsection and vice versa, a new subsection called "All Recreation" was added to the forestwide Recreation section. Direction that applied to more than just dispersed or developed recreation has been moved into the All Recreation subsection.

Concern Statement #253: The Forest Plan should specify standards, guidelines, and management approaches to achieve all desired conditions related to motorized recreation. (56-148)

Response: The Forest Plan contains a variety of plan components related to motorized recreation. Some of these components are designed to manage motorized recreation and ensure the Forest maintains or moves toward its desired conditions. See FW-Rec-All-G-1, FW-Rec-Disp-DC-2 and 4, FW-Rec-Disp-S-1, FW-Rec-Disp-G-1, FW-RdsFac-G-3, FW-InterpEd-DC-5, MA-MtElden-DC-3, MA-Verde-DC-3, MA-LongV-G-1, MA-EastClr-G-1. Other components are designed to reduce potential conflicts between user types. See FW-Rec-All-DC-6 and 7, FW-Rec-All-G-2, FW-Rec-Trails-O-1, FW-Rec-Trails-G-1 and 6, FW-InterpEd-G-3, MA-VolcanWd-DC-3, and MA-VerdeV-G-2 and 3.

Concern Statement #672: The Forest Service should clearly explain the methodology, objectives, and outcomes associated with the Recreation Opportunity Spectrum used by the alternatives. The Forest Service should also provide information on how the Forest's Recreation Opportunity Spectrum has changed over the life of the 1986 Forest Plan and analyze the impacts of the entire motorized route system on the Forest. (56-177, 75-142, 75-148)

Response: Information on the methodology, objectives, and outcomes associated with the Recreation Opportunity Spectrum (ROS) used by the alternatives is included in the Recreation Setting section in the Recreation section in chapter 3 of the environmental impact statement. Additional information on the methodology and assumptions used for the ROS analysis are included in Recreation section in appendix C of the Final Environmental Impact Statement. The Recreation and Special Areas Report (USDA Forest Service 2016d) provides information about the ROS methodology and analysis process and addresses the potential outcomes of implementing ROS desired conditions for each of the alternatives. The Coconino National Forest Recreation Opportunity Spectrum Inventory Report (USDA Forest Service 2016c) describes the step-by-step process that was used to model ROS settings for the forest plan revision effort.

The Affected Environment section in the Recreation and Special Areas Report describes the recreation setting using ROS and the desired ROS used to determine if projects are compatible with forest recreation goals and whether a proposed project moves an area away from or toward its desired condition. This section also discusses how ROS is used in project planning, and provides examples of activities that may impact the ROS. Lack of consistent tracking of ROS changes over 30 years makes it difficult to identify all potential adjustments that have been made.

Comparing the ROS associated with the 1987 forest plan has been difficult for several reasons. Much of the original ROS mapping was hand drawn. It has been scanned to make an electronically available map, but this information cannot be directly compared to GIS maps and consistent computerized application of ROS mapping methodology. The original ROS mapping did not consider adjacent land within the Forest boundary, whereas the action alternative ROS mapping includes all lands within the administrative boundary. In addition, even the total land area of the Coconino NF has changed over time through land exchanges and conveyances, thus comparisons of acres are relative at best. With all of these factors in

play, it was determined that the percent of acres in each ROS class would provide a more meaningful comparison of the potential outcomes of implementing the alternatives. Table 11 in the Recreation and Special Areas Report has been updated to include the percentages associated with the 1986 Forest Plan. This allows for a relative comparison (percentages) between the 1986 Forest Plan quantities by ROS and those used in the forest plan revision analysis.

A site-specific analysis of the entire motorized route system on the Coconino NF was conducted as part of the Travel Management environmental impact statement, which culminated in a Record of Decision in 2011. The Travel Management project analyzed the effects of motorized use and designated the system of forest roads, trails and areas open to motorized use. Specific effects of motorized use for recreation can be found in the Travel Management Recreation Specialist Report (USDA Forest Service 2011) which was prepared as part of the Travel Management project. The forest transportation system identified through the Travel Management process has been used in the ROS modeling prepared for the revised forest plan effort and large scale general analysis is provided regarding the effects of motorized recreation.

Concern Statement #117: The Forest Service should not increase the restrictions on or reduce the availability of motorized dispersed camping. (79-2)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not direct or designate areas for motorized dispersed camping. Specific access and motorized use determinations would be done through future project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212).

The Forest Plan contains a standard that acknowledges the motor vehicle use maps which are produced as part of the implementation of the Travel Management Rule. Camping corridors for motorized dispersed camping are identified on the motor vehicle use maps. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1:

> Motorized vehicle use shall occur as identified on a designated system of roads, trails, and areas (including locations designated for motorized big game retrieval), as defined on motor vehicle use maps, except for those uses authorized by law, permits, and orders in connection with resource management and public safety.

Concern Statement #254: The Dispersed Recreation section in the Forest Plan should include direction that consistently restricts motorized activities to keep down noise near residential areas. (56-163)

Response: The Forest Plan includes a standard that prohibits motor vehicle use beyond the designated system of roads, trails, and areas, as defined on motor vehicle use maps. See FW-Rec-Disp-S-1. Residential areas can be a consideration when routes are being considered for inclusion on the motor vehicle use maps.

Several adjustments to the Forest Plan have been made in response to this comment. Direction on this topic that was formerly included in a management area was moved into the forestwide direction for Trails and Trailheads in the Recreation section. The guideline requires trails to be designed and located in a way to prevent conflicts with neighboring lands. See FW-Rec-Trails-G-1. Another guideline has been added that more specifically addresses the concern of motorized recreation near residential areas. See FW-Rec-Trails-G-6.

Concern Statement #255: The Forest Plan should incorporate Executive Orders 11611, 11644, and 11989 as standards. (56-176)

Response: From the context of the comment, it is assumed that the commenter is referring to Executive Order 11644 (Use of off-road vehicles on the public lands), not Executive Order 11611 (Inspection of

Income, Excess Profits, Estate, and Gift Tax Returns by the Committee on Internal Security, House of Representatives).

While the plan provides guidance for managing impacts from motor vehicles (for example, see FW-RdsFac-S-1, FW-Rec-Disp-DC-2, FW-Rec-Disp-S-1, FW-SpecUse-DC-1), it does not restate existing law or policy, such as Executive Orders 11644 and 11989. Executive Order 11644 was listed in the Vegetation section in appendix D, Other Sources of Information, of the Forest Plan. It has been retained in the Terrestrial Ecological Response Units section in appendix D. Executive Order 11989 was added to the list in the Terrestrial Ecological Response Units section in appendix D.

Concern Statement #300: The Forest Plan should include standards requiring clear and uniform signage to aid motorized recreationists. (59-5, 75-119)

Response: Several adjustments have been made to the Forest Plan in response to these comments although no standard was added. A guideline that requires boundaries and routes to be clearly and uniformly identified has been added to the Dispersed Recreation section. See FW-Rec-Disp-G-1. The Forest Plan also has a desired condition and a guideline to provide visitors to the Forest with properly placed, clearly worded signs and information on authorized motorized use and restriction. See FW-InterEd-DC-5 and FW-RdsFac-G-3.

Concern Statement #11: The Forest Service should prohibit recreational shooting in research natural areas, botanical and geological areas, areas managed for reduced human disturbance identified in Alternative C, the Walnut Canyon Management Area, the Sedona Neighborwoods Management Area, the Long Valley Management Area, part of the Flagstaff Neighborwoods Management Area, and areas associated with illegal dumping to protect wildlife habitats and recreation areas from noise and lead pollution. (5-6, 56-189)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions, such as prohibiting recreational shooting in particular areas. However, the Forest Plan does contain several components that provide a framework to manage recreation activities and encounters. The All Recreation section identifies minimal user and resource conflicts as a desired condition. See FW-Rec-All-DC-6. A guideline in the same section requires recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. The Dispersed Recreations section contains a desired condition for areas used for dispersed recreation across the Forest to retain their natural character to the extent possible and have minimal evidence of human waste and litter, sanitation issues, and resource damage. See FW-Rec-Disp-DC-3. Noise is addressed by an All Recreation desired condition, which seeks opportunities for experiencing solitude and natural soundscapes that are consistent with ROS objectives. See FW-Rec-All-DC-10. Finally, the Soil section would address potential impacts through a desire for soil productivity and functions that are sustained and functioning properly within the capability of the site. See FW-Soil-DC-2.

Specific determinations on whether and how to address recreational shooting in specific areas would be done through future project-level decision making based on site-specific information.

Concern Statement #90: The Forest Service should add a Management Approach to the Dispersed Recreation section of the Revised Plan regarding coordinating "with the recreational outfitters, forest visitors, Arizona Game & Fish Department, Arizona State Parks and National Park Service to educate forest visitors and dispersed campers not to camp within 200 feet of riparian, shoreline, or aquatic recourses (per Leave No Trace principles)." In addition, the Forest Service should modify a guideline in the Long Valley Management Area to be consistent with dispersed camping limitations restrictions elsewhere in the Plan. The existing 200-foot limitation should be increased to 300 feet. (75-130)

Response: This guideline has been removed from the Plan because it is already covered by more strategic forestwide direction. See FW-Rec-All-G-2 and FW-Rec-Disp-G-5. Neither of these guidelines identifies a specific distance limitation for dispersed camping.

In its place, another guideline was crafted from language that was contained in a Long Valley Management Area desired condition. See FW-LongV-G-1.

Strategic direction related to educating forest users about impacts from dispersed recreation (which would include dispersed camping near riparian areas) has been grouped into the Interpretation and Education section. See desired conditions, guidelines, and management approaches in FW-InterpEd.

Concern Statement #250: The Forest Service should provide transparency about the process of identifying the four sites for recreation events and large group gatherings mentioned in the objective for Recreation Special Uses (see Draft Revised Plan FW-SpecUse-O-1), about the infrastructure required, how they would be used or what they would be used for, who the potential users would be, and how the public will be involved in their identification and selection. For Special Designation areas, exclusionary guidelines should be added, i.e., none should be located in the Sedona Oak Creek MA. (74-90)

Response: This Recreation Special Uses objective has not been adjusted in response to this comment. See FW-SpecUse-O-1. This objective falls in the category of recreation special uses and represents just one of the expected outcomes or actions required to accomplish movement toward desired conditions. However, this objective is not a decision to identify any particular pre-approved site. The identification of individual recreation sites is not a plan-level decision, but the sites would be evaluated in separate analysis through future project-level decision making. These decisions would be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual and would include analysis and opportunity for public involvement. Site-specific recreation site planning will use the framework set by the plan (such as desired conditions, standards, guidelines, and suitability determinations) and will consider potential resource impacts, access needs, public input, and alternative views. If undesirable resource conditions resulted from recreation site design or uses, they could be addressed through site-specific evaluation and analysis.

After recreation sites are identified, recreation events and large group gatherings would occur at these recreation sites under a recreation special-use permit. Plan components guide these activities and an evaluation process is already required by law, regulation, and policy, so there is no need to repeat it in the Forest Plan. The specific questions in the comment would be addressed during that process based on the specific proposal being considered and the permit would need to be consistent with the direction in the Forest Plan.

The Forest Plan includes a broad spectrum of plan components that address recreation special uses. Authorized activities would be consistent with the Recreation Opportunity Spectrum settings and associated motor vehicle uses would occur on specifically authorized roads. See FW-SpecUse-DC-1, FW-SpecUse-G-17. Recreation special uses would be consistent with site-specific direction for other Forest resources and community goals; resource impacts would be confined and localized; uses would generally be in areas compatible with use by the general public and the maximum group-size capacities and activities would be identified for each site. See FW-SpecUse-DC-8, 9 and FW-SpecUse-G-1. Permit holders are required to rehabilitate unplanned user-created trails and other impacted areas created by their activities that were not authorized. See FW-SpecUse-S-2. Plan guidelines should further reduce resource impacts and social conflicts. For example, all special-use activities should occur during times, in ways, and in locations that are consistent with the needs of national forest users yet address disturbance and safety concerns for area residents. Permits should not be issued for activities that are proposed to occur in

sensitive resource areas or within 200 feet of perennial streams, springs, or waters that support federally listed or Southwestern Region sensitive species; however, exceptions may be made for hardened sites, water-dependent activities, or safety. See FW-SpecUse-G-2, 3, 18, 19, and 21.

Forestwide direction does not specifically restrict recreation events and large group gatherings in the Sedona-Oak Creek area, but there is specific management area guidance. For example, standards in the Red Rock Management Area would allow four-wheel drive use along the Casner Powerline access through a special-use permit that would be consistent with ROS goals, adjacent wilderness, wildlife objectives, soil protection and where use does not interfere with APS powerline access needs. However, commercial tours are not permitted on this road, and four-wheel groups are not allowed to camp along the Casner Powerline Road between the two gates. In addition, new outfitter-guide permits would not be authorized in this management area in areas that are at or approaching capacity. See MA-RedRock-S-2, 3, 4, and 5.

In addition, there are limitations on horse and pack stock on the five trails in the Red Rock-Secret Mountain Wilderness. See MA-RedRock-S-9 and MA-OakCrk-S-6.

Concern Statement #116: The Forest Plan should include direction that addresses pet waste and invasive plants in the neighborwoods near Flagstaff, Sedona, and Oak Creek Canyon. (56-103)

Response: Rather than only address sanitation and invasive species in "neighborwoods" (NFS land immediately adjacent to Flagstaff and Sedona), the Forest Plan provides several plan components that address these types of concerns wherever they may occur on the Forest, including NFS land immediately adjacent to Flagstaff and Sedona. A forestwide All Recreations desired condition seeks for the recreation settings on the Forest to retain their character. See FW-Rec-All-DC-6. A forestwide All Recreation guideline directs recreational activities, locations, and/or settings to be managed to have minimal user conflicts, to be in balance with the capacity of other resources to support them, to promote public health and safety, and/or to prevent wildlife access to food, trash, and human waste. See FW-Rec-All-G-2. A forestwide Dispersed Recreation desired condition seeks for areas used for dispersed recreation to retain their natural character to the extent possible and have minimal evidence of human waste and litter, sanitation issues, and resource damage. See FW-Rec-Disp-DC-3. Pet waste and invasive plants could impact the recreation setting and natural character of an area and these plan components would guide management in addressing those impacts at the project level based on site-specific information. Furthermore, a management approach has been added to the Trails and Trailheads section to encourage the use of partnerships to assist in trail stewardship, which could help the Forest manage issues associated with pet waste and invasive species. It reminds forest managers to:

> Maintain and expand volunteer partnerships with local communities, organizations, groups, and agencies to assist in trail planning, construction, and stewardship.

Concern Statement #3: The Forest Service should analyze the impacts for low-flying helicopters on visitor experience, solitude, wilderness character, and wildlife, particularly below the Mogollon Rim in the Sedona-Oak Creek area. (1-1, 9-1)

Response: The Recreation Special Uses section in chapter 3 of the environmental impact statement has been updated to discuss the impacts of aircraft, including low-flying helicopters on visitor experience, solitude and wilderness character. The Wildlife, Fish, and Plant section in chapter 3 discusses the impacts of disturbance (which includes aircraft) on wildlife.

Management of aircraft in flight is generally outside the scope of the Forest Plan; the Forest has no authority to limit or manage aircraft or helicopters that do not take off from or land on the Forest unless the flight involves some other activity permitted by the Forest Service, such as filming. With this in mind,

the Forest Plan now includes several components that address the potential impacts associated with low-flying airplanes and helicopters. These include restrictions on commercial filming by aircraft to protect threatened, endangered, and sensitive species and minimize impacts to residential areas and primitive recreational opportunities, and prohibitions on motorized aircraft landings and takeoff. See FW-SpecUse-S-1, FW-SpecUse-G-13, MA-RedRock-G-3, MA-OakCrk-G-11, and MA-SedN-G-4. In addition, a forestwide desired condition promotes natural soundscapes that are consistent with Recreation Opportunity Spectrum objectives for an area. See FW-Rec-All-DC-10. A management approach in the Designated Wilderness section of the revised plan reminds forest managers to collaborate with the Federal Aviation Administration and others to minimize disturbances caused by aircraft over designated wilderness areas. It reads:

> Collaborate with Federal Aviation Administration, airport administrations, air tour operators, military and government agencies, and other aircraft operators to minimize disturbances caused by aircraft over designated Wilderness areas of the Coconino National Forest. Aircraft disturbances include, but are not limited to, diminishing solitude and primitive recreation opportunities and disruption to key wildlife areas during important times of their life cycle. Examples could include peregrine falcon nesting sites and big game wintering habitat. Encourage aircraft operators to adhere to Federal Aviation Administration's Notice to Airmen regarding minimum altitudes over wilderness.

Concern Statement #431: The Forest Plan should include guidance and restrictions on noise and disturbances from low-flying aircraft and helicopters. (56-182, 56-184, 74-84)

Response: Management of aircraft in flight is generally outside the scope of the Forest Plan; the Forest has no authority to limit or manage aircraft or helicopters that do not take off from or land on the Forest unless the flight involves some other activity permitted by the Forest Service, such as filming. With this in mind, the Forest Plan includes numerous components that address the potential impacts associated with low-flying airplanes and helicopters.

The Special Uses standard (prohibiting motorized aircraft landings and takeoffs on the Forest) and guideline (restricting commercial filming by aircraft in the Sedona/Oak Creek area) have been retained. See FW-SpecUse-S-1 and FW-SpecUse-G-13. The inclusion of these components in the Special Uses section gives them forestwide application.

The guidelines related to use of aircraft for commercial filming near Sedona and Oak Creek have been retained in the direction for the relevant management areas. See MA-RedRock-G-3, MA-OakCrk-G-11, and MA-SedN-G-4. Management approaches in the Sedona area MAs addresses collaboration with FAA.

In a more general manner, the concept of natural soundscapes has been addressed in a forestwide All Recreation desired condition. See FW-Rec-All-DC-10. This component expresses a desire that natural soundscapes are consistent with the Recreation Opportunity Spectrum objectives for an area.

Finally, a management approach has been added to the Designated Wilderness section reminding forest managers to collaborate with the Federal Aviation Administration and others to minimize disturbances caused by aircraft over designated wilderness areas. It states:

> Collaborate with Federal Aviation Administration, airport administrations, air tour operators, military and government agencies, and other aircraft operators to minimize disturbances caused by aircraft over designated Wilderness areas of the Coconino National Forest. Aircraft disturbances include, but are not limited to, diminishing solitude and primitive recreation opportunities and disruption to key wildlife areas during important times of their life cycle. Examples could include peregrine falcon nesting sites and big game wintering habitat. Encourage aircraft operators to adhere to Federal Aviation Administration's Notice to Airmen regarding minimum altitudes over wilderness.

Concern Statement #126: The Forest Plan should include a seasonal closure for recreational campfires to reduce the risk of an accidental ignition of a wildfire. (56-10, 66-1, 87-2)

Response: The Forest has an existing policy and process to address when to close the Forest and ban campfires based on specific existing conditions. Although the Forest Plan does not repeat this policy nor does it provide a specific seasonal closure for campfires, it does contain a guideline requiring recreational activities to be managed to promote public health and safety. See FW-Rec-All-G-2. The existing policy and process are consistent with this guideline and can be viewed as an extension of this guideline.

Concern Statement #134: In the revised plan, the Forest Service should delete the word "overcrowding" in a desired condition under Dispersed Recreation. In this desired condition, it is a constraint in dispersed camping areas and a trigger to regulate use. Overcrowding is not defined and may be better defined by occupants. Instead, the desired conditions for soil and vegetation may better define overcrowding when considered with the length of time of occupancy. (77-11, 94-11)

Response: The sentence referencing overcrowding has been deleted as suggested for several reasons. The direction now recognizes a range of dispersed camping opportunities that is not constrained by an undefined lower density of users. See FW-Rec-Disp-DC-4. Furthermore, the desire for natural character as part of dispersed recreation is already addressed in another desired condition. See FW-Rec-Disp-DC-3.

Concern Statement #146: The Forest Plan should include direction on public outreach efforts for trail planning. (56-164, 56-165)

Response: No change to plan direction has been made in response to this comment. Communication plans are developed at the project level and vary depending on the project. However, there are several management approaches in the Trails and Trailheads subsection of the Recreation section of the plan that provide suggestions regarding public engagement during trail planning. These management approaches state:

> Collaborate with county and city trails coordinators, local groups, and area residents, when conducting trail planning. Consider needs for non-motorized and motorized trails and provide opportunities for both.
>
> Maintain and expand volunteer partnerships with local communities, organizations, groups, and agencies to assist in trail planning, construction, and stewardship.
>
> Coordinate trails and trailhead parking with future development on adjacent lands so as to be proactive in designing trails and trailheads to maintain access to public lands and protect resources.

Concern Statement #247: The Forest Plan should include information on methods for creating and maintaining user-friendly trails. (99-13)

Response: The suggested management approach has not been added to the Forest Plan. The agency already has comprehensive guidance on the creation and maintenance of trails. See FSH 2309.18, 4 - Trail Operation and Maintenance. It is unnecessary to duplicate or supplement that guidance in the Forest Plan. A reference to FSH 2309.18, 4 is included in the Forest Plan in the Dispersed Recreation, Trails and Trailheads section in appendix D, Other Sources of Information.

Concern Statement #181: The Forest Plan should manage the trail system in the Mount Elden Management Area. Some commenters requested a limitation on expanding the trail system until the Forest addresses illegal trail building in the area. Other commenters supported expansion of the trail system to address the ongoing increase in growth of demand for recreational trails opportunities. (56-85, 56-86, 67-9)

Response: The Forest Plan has been adjusted in response to this comment. A large desired condition in the forestwide Dispersed Recreation section has been divided into several plan components. Part of that plan component was converted in a desired condition for the All Recreation section. See FW-Rec-All-DC-6. This desired condition states:

> Recreation opportunities are balanced with the capacity of forest resources to support them. There are minimal user and resource conflicts. As development and population in the region continue to grow and new forms of recreation emerge, recreation settings on the Coconino NF are stable, retaining their natural character. Short-term increases in recreation during holidays and weekends do not result in long-term adverse effects to other forest resources.

Desired conditions in Trails and Trailheads promote a variety of trail types, challenge levels for diverse users in a variety of settings; the level of development at trails is appropriate for the site, use, ROS setting, and is sustainable; and damage to resources from visitor use at trails and trailheads is within the ability of Forest to mitigate. See FW-Trails-DC-2, 3, 4. In addition, a desired condition in the Trails and Trailheads section states that trail use remains on the established trail surface, especially in high traffic or sensitive areas and unplanned user-created trails are rare. See FW-Trails-DC-11.

Several guidelines are included in the Forest Plan to help ensure that decisions on recreation opportunities meet or move toward this desired condition. See FW-Rec-All-G-1 and 2. In addition, a guideline in Trails and Trailheads would require that unplanned, user-created trails be rehabilitated and managed to prevent future access. See FW-Trails-G-3.

The Mount Elden Management Area also contains a desired condition on this topic. That desired condition seeks a trail system that is designed to be sustainable while balancing user experiences and impacts. See FW-MtElden-DC-1.

Concern Statement #248: The Forest Plan should include a management approach to work with the Beaver Creek community to provide opportunities for developed and dispersed recreation, including camping, in the Beaver Creek area. (99-17)

Response: The Forest Plan has been adjusted in response to this comment. Although a separate management area has not been created for the Beaver Creek area, several management approaches relating to recreation have been added to the Verde Valley Management Area, the management area that encompasses the Beaver Creek area. These management approaches remind forest managers to:

> Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trail head planning and construction efforts.
>
> Work with stakeholders to develop collaborative solutions to problems that arise from high use recreation.

Similar language can be found in the forestwide All Recreation section of the Forest Plan, where a management approach reminds forest managers to:

> Collaborate with State and Federal agencies including National Park Service, Arizona State Parks, and Arizona Game and Fish Department; concessionaires; chambers of commerce; nonprofit organizations; Northern Arizona University, State, city and county governments; recreation stakeholders; and local communities and citizens, partners, and volunteers regarding provision of recreation opportunities in northern Arizona and communicating these to the public. Work in

> partnership to find creative solutions to operate and maintain recreation sites, trails and trailheads, and provide interpretive and environmental education. Determine gaps and overlaps in opportunities and resolve conflicts between users, and providers. Work together to determine activities that increase our capacity to serve a diverse population while promoting social, economic, and natural resource sustainability.

The forestwide Trails and Trailheads section of the Forest Plan also contains a relevant management approach, which reminds forest managers to:

> Coordinate trails and trailhead parking with future development on adjacent lands so as to be proactive in designing trails and trailheads to maintain access to public lands and protect resources.

Concern Statement #184: The Forest Plan should include a restriction on the collection of dead and down firewood to protect remaining downed logs near the popular campsites around Marshall Lake. The Forest Plan should also require trash and toilet paper to be cleaned from these campsites periodically. (56-101)

Response: No specific restriction has been added in response to this comment. The desired presence of downed logs is already addressed through plan language that supports base levels of coarse woody debris (including logs). For example, see FW-Soil-DC-2, FW-Rip-All-DC-1, FW-Rip-RipType-DC-5, FW-TerrERU-All-DC-2, FW-TerrERU-PJ-DC-2, 7, and 12, FW-TerrERU-AspMpl-DC-1, and FW-TerrERU-PP-5. If the levels of coarse woody debris near Marshall Lake are found to be lacking, site-specific restrictions can be considered to move the area back toward desired conditions.

Forestwide direction also addresses concerns about public health and litter in recreation sites. Forestwide desired conditions promote minimal evidence of human waste and litter, sanitation issues, and resource damage. See FW-Rec-All-DC-6 and FW-Rec-Disp-DC-3. Forestwide guidelines recommend that recreational activities and settings be managed to maintain or move toward desired conditions, and to promote public health and safety. See FW-Rec-All-G-1 and 2. Restrictions or closures could be considered, but only after other feasible options have been implemented.

Concern Statement #185: The Forest Plan should include direction to manage steep, downhill mountain biking (also called gravity riding) and to prohibit that activity in the Mount Elden area. (27-2, 27-5, 27-9, 56-88, 56-137, 56-141)

Response: The Forest Plan provides the framework that would guide site-specific consideration of this activity. The Forest Plan provides desired conditions for the full array of ecological resources on the Forest. The Forest Plan also has guidance on user conflicts. See FW-Rec-All-G-2.

Whether this activity is impacting desired conditions in a particular area and how to manage this activity is a site-specific decision. The identification of specific prohibitions on mechanized travel would be considered in future project-level decisions. For these reasons, a standard has not been added in response to these comments.

Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect. The level of Forest Service law enforcement is dependent on staffing, which is reflective of the budget allocated to the Forest Service from Congress.

Concern Statement #251: The Forest Plan should increase the issuance of outfitter guide permits in order to meet demand for guided hikes on the San Francisco Peaks. (90-5)

Response: The issuance of outfitter permits is outside of the scope of the Forest Plan. Site-specific decisions on proposals such as this are made at the project level, not the forest plan level. The Forest Plan

provides direction on recreation special uses and how those permitted activities should fit with other forest resources (see FW-SpecUse-DC-8 and FW-SpecUse-G-16, 17, and 18), but it does not make any site-specific decision on any particular permit proposals.

Concern Statement #192: The Forest Service should conduct more enforcement against littering on public lands. Increase the fees/fines to pay for enforcement and use volunteers, too. (1788-1)

Response: No change to the plan has been made in response to this comment. Enforcement is not a forest plan component, but is a requirement of the Agency, regardless of the land management plan in effect. The revised Plan does acknowledge the concern with litter on the Forest in several plan components. See FW-Rec-All-DC-5, FW-Rec-Disp-DC-3, and FW-Rec-All-G-2. These plan components would guide site-specific considerations regarding litter.

Concern Statement #210: The Plan should acknowledge spelunking as a recreational activity and acknowledge the potential for that activity to impact caves. (75-53, 80-8)

Response: The types of recreational opportunities available on the Forest are discussed in the General Description and Background for all Recreation. Spelunking has been listed as a specific recreational opportunity and caves have been listed as an area that can provide recreational experiences.

The potential impacts to cave resources that could occur from this recreational activity are addressed in several plan components. See FW-BioPhys-Geo-DC-1, 3, and 5; FW-BioPhys-Geo-S-1; FW-BioPhys-Geo-G-1, 2, 6, and 7; FW-Rec-All-DC-7; FW-Rec-All-G-1 and 2. See also Management Approaches in the FW-BioPhys-Geo section, which remind forest managers to:

> Encourage partnerships with organizations, scientists, and outdoor recreationists to secure, preserve, and protect forest geological features and their resources.
>
> Utilize current cave and karst management plans and guides.
>
> Foster collaboration with the U.S. Fish and Wildlife Service, Bat Conservation International, Arizona Game and Fish Department, the National Speleological Society, and other stakeholders to address conservation, interpretation, and education management for cave-dependent species and associated resources. For example, this collaboration could assist with understanding the cause and transmission of white-nose syndrome (which is not currently well understood) or with the development and implementation of cave and karst management plans.
>
> Keep cave locations confidential except for caves that have been identified for recreational use. Cave records are managed at Forest Service locations where they are kept secured.
>
> Maintain a current list of significant caves on the Forest and nominate new significant caves when identified. Monitor significant caves or other geological features to determine visitor impacts and the conditions of key resources.
>
> Educate the public about the unique ecological and aesthetic value of biophysical features including safety, etiquette, disease prevention, and resource protection.

Concern Statement #256: The Forest Plan should include a management approach reminding forest managers to provide leadership in educating recreational outfitters and forest visitors the importance of no human litter and to be aware of "Leave No Trace principles." (74-86)

Response: A management approach has been added to the Interpretation and Education section. It addresses the concern related to littering by invoking tools like Leave No Trace and Tread Lightly as follows:

> Share Leave No Trace and Tread Lightly concepts and practices in forest interpretation and visitor education.

Concern Statement #259: The Forest Plan should retain the desired condition in the Dispersed Recreation section that recognizes mountain bicycling as a valid use of a multi-use trail. (see Draft Revised Plan, FW-Rec-Disp-DC-16) (72-1)

Response: Thank you for your comment. Upon review, it was determined that this desired condition contained several disparate topics. During the editing process to address this problem, the express reference to mountain bicycling was removed from the desired condition, because the intent was to discuss trails providing diverse settings and opportunities for a variety of skill levels, not highlight one particular use of multi-use trails. The portions of the desired conditions relevant to this discussion can now be found in FW-Rec-Trails-DC-1 and 2.

To keep from losing the reference to mountain biking, it is now highlighted in the General Description and Background in several sections of the plan. See the General Description and Background in the Dispersed Recreation and Trails and Trailheads subsections of the forestwide Recreation section as well as many of the management areas discussed in chapter 3 of the Forest Plan.

Concern Statement #260: The Forest Plan should incorporate the following methods to guide future recreation/trail projects to reduce bicycle impacts: Walk bicycles in certain areas; One-way-only trail sections; Speed limits (though these may be difficult to enforce); Restrict use by time of day, day of week, week of month, month of year; Restrict use by season (e.g., to protect soils or sensitive habitats); Separate different types of uses at trailheads and congested areas; Party size limits; Area permits/licenses, reservations, and trip permits, though these should be instituted only in special situations as a last resort; Trail alignment to minimize soil erosion, avoid wetlands, sensitive plant or animal habitat, and sensitive archaeological or cultural features; Trail alignment to maximize compatibility with adjacent land use and connecting trail use; Natural and artificial design features that restrict bicycle speed, such as barriers and speed bumps, which are not an undue impediment to other non-motorized users; Design features that enhance sight distance, e.g., locating the trail away from tall brush; Design features that minimize trail erosion: proper grades, turn radii, tread hardening, and drainage control; Wide or pull-out sections to facilitate safe passing; Design features for user enjoyment: loop trails, scenic destinations, picnic/camp sites; Barriers to prevent leaving trail. Block and obliterate (rehabilitate) unauthorized trails. (56-89)

Response: These methods are more appropriate for consideration at the project level when site-specific information is being considered on a particular route. A Trails and Trailheads guideline in the forestwide Recreation section would require consideration of these types of design features at the project level to promote sustainable trail surfaces, prevent conflicts with neighboring lands, address impacts to other resources, and consider user experiences. See FW-Rec-Trails-G-1.

Concern Statement #261: The Forest Plan should recognize bicycles as one of the forms of alternative modes of transportation mentioned in the desired conditions for Oak Creek Management Area (see Draft Revised Plan SA-OakCrk-DC-9) and elsewhere throughout the Forest that encourage alternative modes of transportation, such as bicycles, that reduce automobile dependency and traffic congestion. (67-11)

Response: The Forest Plan is strategic in nature and does not include project-level decisions. The specific types of alternative modes of transportation that can be used in an area is a project-level decision that

would be based on site-specific information. However, the plan does specifically mention bicycles in several places. For example, dispersed recreation should be limited to day-use traffic, by foot or bicycle, to maintain water quality and watershed function in the Inner Basin Management Area. See MA-InBsn-G-7. Desired conditions for Scenic Roads would promote travel routes along the Red Rock All-American Road that safely accommodate bicycles and pedestrians and connect them to the urban trail system. See SA-ScenicRds-DC-3. Desired conditions in the Mount Elden Management Area would promote a variety of trail experiences for non-motorized recreation in the Fort Valley Trail System and Mt. Elden/Dry Lake Hills Trail System. See MA-MtElden-DC-3 and 4.

Concern Statement #284: The Forest Plan should incorporate input from the broadest range of individuals as advocates and allies in resource protection and forest use, especially hunters. (59-4)

Response: There are over 1,600 entities on the forest plan revision mailing list. Some groups on the mailing list are affiliated with or support hunting including Arizona Sportsman for Wildlife Conservation, the National Rifle Association, Rocky Mountain Elk Foundation, Arizona Elk Society, and Arizona Game and Fish Department. We assume many individuals on the mailing list hunt as well, but they may not have specifically identified themselves as hunters. All comments received from the public were read and considered and many comments resulted in modifications to the Forest Plan.

Hunting and other wildlife-related recreation is specifically mentioned in General Description and Background for Constructed Waters, Wildlife, Fish, and Plants, Recreation, and the following management areas: San Francisco Peaks, Anderson Mesa, and House Mountain-Lowlands.

Desired conditions in Dispersed Recreation, and the Pine Belt, Anderson Mesa, and House Mountain-Lowland Management Areas emphasize hunting and promote abundant and high-quality opportunities for hunting and other wildlife-based recreation opportunities. See FW-Rec-Disp-DC-5, MA-PineBelt-DC-2, MA-AMesa-DC-2, and MA-HouseMtn-DC-1.

The Forest Plan contains several components that acknowledge the value of collaboration with organizations and individuals to provide better protection for forest resources. The Wildlife, Fish, and Plants section contains a desired condition for residents and visitors to appreciate, learn, and have ample opportunities to experience, appreciate, and learn about the wildlife, fish, and plant resources of the Forest. See FW-WFP-DC-10. Through numerous management approaches, the Forest Plan encourages forest managers to work with partners to achieve a wide variety of outcomes, including: protection of caves, karst, cliffs, and talus slopes and their associated resources (see FW-BioPhys-Geo); management and monitoring of bat roosts (see FW-BioPhys-Geo); inventorying, classification, assessment, and prioritization of springs and recharge areas for restoration, and to implementation of restoration activities (see FW-Rip-Spr); identification and development of concepts, tools, and research opportunities applicable to ecosystem restoration and vegetation management (see FW-TerrERU-All); grassland restoration, grassland connectivity, and education (see FW-TerrERU-Grass); reduction of the risk of uncharacteristic fires that are hazardous to values in the wildland-urban interface (see FW-TerrERU-IC); coordination on information, education, and knowledge gaps as they relate to promoting and improving wildlife, fish, and plant resources and management (see FW-WFP); opportunities for partnerships and volunteerism in all heritage program elements (see FW-Hrtg); documentation, preservation, interpretation, and management of heritage sites and evaluation and development of creative management opportunities (see FW-Hrtg); provision of recreation opportunities in northern Arizona and communication of these to the public (see FW-Rec-All); identification of creative solutions to operate and maintain recreation sites, trails and trailheads, and provide interpretive and environmental education (see FW-Rec-All); identification of gaps and overlaps in opportunities and resolution of conflicts between users and providers (see FW-Rec-All); determination of activities that increase the Forest's capacity to serve a diverse population while promoting social, economic and natural resource sustainability (see FW-Rec-

All); and assistance with planning, construction, and maintenance of motorized and non-motorized recreation opportunities and the fostering of a low-impact conservation ethic (see FW-Rec-Disp).

Concern Statement #292: The Forest Service should replace FW-WFP-DC-11 with: "The forest provides abundant and high-quality opportunities for hunting, fishing, and non-consumptive wildlife-based recreation." (75-89)

Response: Several adjustments were made in response to this comment. Because the activity discussed in this desired condition is a form of recreation, this plan direction has been moved to the Recreation section in the Forest Plan. Wildlife-based recreation in general is addressed in FW-Rec-All-DC-8. The comment's specific suggestions regarding hunting and fishing have been incorporated into a Dispersed Recreation desired condition. See FW-Rec-Disp-DC-5.

Concern Statement #293: The Forest Plan should not include desired conditions on where and how non-native sport fish should be managed in relation to native species. See Draft Revised Plan FW-WFP-DC-11. Management authority for sport fish rests with the Department, not the Forest Service. (75-90, 75-91, 75-92, 75-93)

Response: The Forest Plan has been adjusted in response to this comment. The part of the desired condition expressing an emphasis on native sport fish has been modified. The Forest Plan now expresses a desire for forest visitors to have an appreciation for native fish and for native sport fishing to emphasize where the opportunities exist. See FW-WFP-DC-10. A management approach in the Wildlife, Fish, and Plants section reminds forest managers to coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for native species and the management of sport and native fishes, including the identification of refugia for native fish. It states:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

In addition, a management approach in the All Recreation section states:

> Coordinate with the Arizona Game and Fish Department to provide fishing access to meet goals and objectives of the Department's fisheries plans.

Furthermore, a management approach in Designated Wilderness Areas states:

> Coordinate with the Arizona Game and Fish Department on management of native species within wilderness per the current memorandum of understanding.

Concern Statement #298: The Forest Plan should include standards authorizing motorized big game retrieval. These standards should also be applied to all other national forests in Arizona. (75-122, 75-123, 75-124, 75-125, 75-126, 75-127)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the plan does not direct or designate routes or areas for motorized travel. Specific access and motorized use determinations would continue to be done through future project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212).

The standards applied to other national forests in Arizona are outside of the scope of the Forest Plan and plan revision process of the Coconino NF.

The Forest Plan contains a standard that reflects the motor vehicle use maps produced as part of the implementation of the Travel Management Rule. See FW-RdsFac-S-1 and FW-Rec-Disp-S-1:

> Motorized vehicle use shall occur as identified on a designated system of roads, trails, and areas (including locations designated for motorized big game retrieval), as defined on motor vehicle use maps, except for those uses authorized by law, permits, and orders in connection with resource management and public safety.

Concern Statement #258: The Forest Plan should include a standard that requires hunters on Forest Service lands obtain information on the negative impacts of lead shot on California condors. (56-186)

Response: In response to this comment, a forestwide Interpretation and Education section has been modified to acknowledge that the promotion and practice of lead reduction is a desired condition. See FW-InterEd-DC-1.

Concern Statement #299: The Sedona/Oak Creek Management Area desired condition in the Draft Revised Plan that addresses consistency with the applicable desired recreation settings (see Draft Revised Plan MA-SedOak-DC-22) should be adjusted. Rather than recognizing that there are places in this management area where social encounters and road access are inconsistent the applicable desired recreation settings and that these inconsistencies are continue, the Forest Plan should state that the goal (i.e. Desired Condition) is to improve upon the current situation and eliminate these recreation setting inconsistencies. (74-95, 83-11)

Response: This desired condition has been adjusted in response to this comment. Because managing for desired recreation settings is an issue that applies to the whole forest, some of this direction has been moved into the forestwide All Recreation section. See FW-Rec-All-DC-4. This desired condition has been adjusted to remove the recognition that there may be inconsistencies with the desired condition in certain areas. The desired condition states that Recreation Opportunity Spectrum (ROS) settings provide the general context for social encounters and access in particular locations, but acknowledges that localized areas within a particular setting may be different from the overall setting.

In addition to this forestwide direction, all four of the Sedona-Oak Creek management areas include a desired condition for social encounters to be consistent with ROS settings. See MA-RedRock-DC-7, MA-OakCrk-DC-4, MA-HouseMtn-DC-3, and MA-SedN-DC-3.

A guideline in the Red Rock Management Area specifically addresses conditions in Broken Arrow Basin. See MA-RedRock-G-5:

> The parking, staging areas, and main four-wheel drive road at Broken Arrow Basin should be managed for the ROS setting of "rural" because of the area's high level of use. The physical setting and maintenance level of the road should be managed as semi-primitive motorized to be consistent with the surrounding area.

Finally, there was a reference to anticipated development of State Routes 179 and 89A, which has already occurred, so that direction has been removed from the Forest Plan.

Concern Statement #301: The Forest Plan should recognize Arizona Snowbowl's Master Development Plan. Absent of direct recognition, a statement of acknowledgement of approved

Master Development Plans as policy should be adopted or included in the appropriate location within the Forest Plan. (90-1)

Response: The Forest Plan references outside sources of information, such as the Master Development Plan, in appendix D. A reference to the Master Development Plan has been included in San Francisco Peaks Management Area section in appendix D.

Concern Statement #307: The Forest Plan should leave Recommended Wilderness Areas open to bicycle access if such access is currently allowed until Congress sees fit to designate these areas as Wilderness. (67-3)

Response: The direction related to mechanized use in recommended wilderness areas has been retained in the Forest Plan. See SA-RWild-DC-6 and SA-RWild-G-1.

Concern Statement #312: The Forest Plan should allow continued access for bicycles unless the presence of bicycles can be demonstrated to have significantly adverse impacts to resources or social conditions on the Forest, or bicycle use is prohibited by law. (67-1)

Response: The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. It does not contain project and activity decisions such as specific access limitations for bicycling. Any specific access limitations would be evaluated and implemented through future project-level decision making that would consider impacts to resources or social conditions on the Forest. Desired conditions and guidelines for recommended wilderness provide guidance for future project-level decisions. See SA-RWild-DC-6, SA-RWild-G-1 and 5:

> Mechanized recreation occurs at levels that maintain and do not detract from wilderness values.
>
> Existing structures should be maintained, but not expanded to maintain the area's wilderness character. Maintenance of existing structures should be carried out in a manner that does not expand the evidence of motor vehicle and mechanized equipment use beyond current conditions to maintain the area's wilderness character.
>
> New trails should be designed for non-motorized and non-mechanized activities to preserve the area's wilderness character.

Concern Statement #308: The Forest Plan should include direction related to soundscapes and management of noise. (56-180, 56-183, 889-1, 1278-1)

Response: A plan component related to this concept has been adjusted to have forestwide application and to expressly mention the desire for natural soundscapes that are consistent with ROS objectives. See FW-Rec-All-DC-10.

Concern Statement #320: The Forest Plan should identify enforcement mechanisms for addressing illegal dumping associated with recreational target shooting. (56-187)

Response: No change has been made to the plan in response to this comment. Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect.

Concern Statement #346: The General Description and Background for the Walnut Canyon Management Area section of the Forest Plan should be corrected to state that Lake Mary Road is south and west of Walnut Canyon, not north and west Walnut Canyon. (56-98)

Response: The General Description and Background for the Walnut Canyon Management Area section has been adjusted as suggested. It now reflects that Lake Mary Road is south and west of Walnut Canyon.

Concern Statement #367: The Forest Plan should provide for further improvement and marking of the Chaves Trails extensions in the Beaver Creek area. (91-2)

Response: The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. For example, it includes a desired condition for a system of well-marked and well-maintained sustainable trails that provides opportunities for visitors to explore the Forest and surrounding areas. See FW-Rec-Trails-DC-1. The Forest Plan does not contain project and activity decisions, such as improvements and marking for particular trails. Those decisions are made at the project level based on site-specific information.

Concern Statement #436: The Forest Plan should propose new trail systems and evaluate their suitability on an individual basis. (56-161)

Response: The Forest Plan provides guidance to develop or modify 2 to 8 trail systems within 10 years of plan approval. See FW-Rec-Trails-O-1. Potential changes to the Coconino NF's trail systems are not plan-level decisions, but would be evaluated in separate analysis through future project-level decision making. These decisions would be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual, and would include analysis and opportunity for public involvement. Site-specific trail planning will use the framework set by the plan (such as desired conditions, standards, guidelines, and suitability determinations) and will consider potential resource impacts, access needs, public input, and alternative views. If undesirable resource conditions resulted from trail design or uses, they could be addressed through site-specific evaluation and analysis.

Concern Statement #437: For the 2 to 8 trail systems anticipated by the Dispersed Recreation objective (see Draft Revised Plan, FW-Rec-Disp-O-1), the Forest Service should plan the new trails with specific input from each user group and include professional design and construction advice, for example from a Trail Specialist, a member of the IMBA Trail Solutions Program. (72-5)

Response: Potential changes to the Coconino NF's trail systems would be evaluated in separate analysis through future project-level decision making. These decisions would be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual, and would include analysis and opportunity for public involvement. Site-specific trail planning will use the framework set by the plan (such as desired conditions, standards, guidelines, and suitability determinations) and will consider potential resource impacts, access needs, public input, and alternative views. If undesirable resource conditions resulted from trail design or uses, they could be addressed through site-specific evaluation and analysis.

The Forest Plan contains several components that would promote collaboration with interested user groups. A guideline in the Trails section directs trails to be designed and built with user experiences in mind. See FW-Rec-Trails-G-1. A Trails management approach reminds forest managers to collaborate with user groups, among others, when conducting trail planning. It states:

> Collaborate with county and city trails coordinators, local groups, and area residents, when conducting trail planning. Consider needs for non-motorized and motorized trails and provide opportunities for both.

Notable law, regulation, and policy related to trails and trailheads is located in appendix D in the plan.

Concern Statement #445: The Forest Plan should authorize motorized camping within 300 feet of all open roads. (59-6, 75-120)

Response: No change has been made to the Forest Plan in response to this comment. Authorizing motorized camping in particular areas is not a plan-level decision. This concern is addressed under the Travel Management Rule, in travel management planning.

Concern Statement #446: The Forest Plan should acknowledge the Ski Area Summer Activities Policy and recognize that ski areas provide recreational opportunities and can help resolve user conflicts in other locations of the Forest. (90-2)

Response: The Forest Plan has been adjusted in response to this comment. The Ski Area Recreational Opportunity Enhancement Act of 2011 has been added to appendix D, Other Sources of Information, along with the other laws, regulations, and policies that apply to Special Uses.

The Forest Plan does not expressly address ski areas or the recreational opportunities they may provide. The Forest Plan provides strategic guidance for management of the resources and activities on the Forest. For example, a desired condition in the All Recreation section seeks to provide a broad spectrum of developed and dispersed recreation settings, ranging from undeveloped, with opportunities for primitive character, challenging access, and solitude, to more developed, with infrastructure, easier access, higher levels of social interaction, and increased user comforts. See FW-Rec-All-DC-4. Another All Recreation desired condition seeks minimal user and resource conflicts. See FW-Rec-All-DC-6. Whether a ski area is the appropriate mechanism to help meet or move toward these desired conditions is a project-level decision that would be based on site-specific information and public involvement.

Concern Statement #447: The objective to develop Schnebly Hill Vista as a viewpoint, interpretative site, and trailhead should be removed from the Forest Plan. (74-98)

Response: This objective has been removed from the Forest Plan in response to this comment. This objective was carried forward from the current plan as part of the effort to retain the majority of the direction related to the Sedona-Oak Creek area. There are no current plans to pursue this type of development at Schnebly Hill Vista. Removal of this objective does not prevent the Forest from considering these or other developments in this area in the future. Any project would be required to be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual, and include analysis and opportunity for public involvement.

Concern Statement #454: The Access Fund and local climbers should assist with the Oak Creek Management Area management approach to develop a rock climbing management strategy for the Oak Creek Vista area in order to ensure that the strategy addresses the site-specific needs of the climbing community. (70-4)

Response: This management approach has been adjusted to have more strategic, forestwide application, and moved to the Dispersed Recreation section. It states:

> Develop management plans and/or strategies through collaborative efforts for specific dispersed recreation activities or locations to address user needs, visitor safety, and resource protection. Activities or locations could include motorized recreation for Cinder Hills OHV Area, rock climbing at the Oak Creek Vista, and mountain biking around Sedona.

Another Dispersed Recreation management approach addresses the concern that the climbing community should be involved in management of recreation opportunities on the Forest. It states:

> Establish long-term partnerships with recreation organizations to help plan, construct, and maintain motorized and non-motorized recreation opportunities and foster a low-impact conservation ethic.

Concern Statement #455: The Forest Plan should adjust the Dispersed Recreation desired condition related to communication and interpretive messages (see Draft Revised Plan FW-Rec-Disp-DC-8) to provide explicit language on litter enforcement, placement of refuse containers and collection schedules, and efforts to educate forest visitors about littering. (75-90, 75-91)

Response: No changes have been made to the Forest Plan in response to this comment. The enforcement of laws, regulations, and policies are not forest plan-level decisions. Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect. Identifying where to place refuse containers and when to collect that refuse are not plan-level decisions. These types of decisions are made at the project level based on site-specific information. Likewise, the Forest Plan does not define specific interpretive efforts to educate forest visitors about littering. The Forest Plan does include several components that address littering, which would guide future projects to address the topic accordingly. See FW-Rec-All-DC-5, FW-Rec-Disp-DC-3, and FW-InterpEd-DC-1.

Concern Statement #461: The Forest Plan should broaden the Dispersed Recreation desired condition related to angling opportunities (see Draft Revised Plan FW-Rec-Disp-DC-19) to include a wider variety of settings. (75-115)

Response: The Forest Plan has been adjusted in response to this comment. This plan component has been adjusted to increase its scope and to have more strategic application by referring to wildlife-based recreation and a variety of settings. See FW-Rec-All-DC-8.

Concern Statement #455: The Forest Plan should provide explicit language on litter enforcement, placement of refuse containers and collection schedules, and efforts to educate forest visitors about littering. (56-171)

Response: No changes have been made to the Forest Plan in response to this comment. The enforcement of laws, regulations, and policies are not forest plan-level decisions. Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect. Identifying where to place refuse containers and when to collect that refuse are not plan-level decisions. These types of decisions are made at the project level based on site-specific information. Likewise, the Forest Plan does not define specific interpretive efforts to educate forest visitors about littering. The Forest Plan does include several components that address littering, which would guide future projects to address the topic accordingly. See FW-Rec-All-DC-5, FW-Rec-Disp-DC-3, and FW-InterpEd-DC-1.

Concern Statement #457: The Forest Service should provide additional information on the recreational shooting suitability determination that is included in Alternative C. For example, why were these areas identified as not suitable for recreational shooting? Are these areas used by or popular with recreational shooters? What information is being used to determine if recreational shooting is having an impact on others? What areas are already closed to recreational shooting under existing rules and regulations? (73-1, 73-4, 75-5, 73-6, 73-7)

Response: A recreational shooting suitability determination was included in alternative C because the Forest received comments from stakeholders suggesting that recreational shooting causes noise, safety concerns, and other disturbance, which in turn can disrupt the recreational opportunities of those seeking quiet recreation settings. This recreation suitability determination has been retained in alternative C as part of a reasonable range of alternatives.

The determinations that an area was not suitable for recreational shooting were based on factors related to quiet recreation, reduced human-related disturbance, and consistency with other direction for those areas under alternative C. Based on these factors, established and proposed research natural areas, Walnut Canyon Management Area, Sedona Neighborwoods Management Area, Long Valley Management Area, and portions of the Flagstaff Neighborwoods Management Area (based on population density) were determined to be not suitable for recreational shooting. Furthermore, all of the management areas that emphasize reduced human-related disturbance (referred to as Wildlife Habitat Management Areas in the Draft Environmental Impact Statement) would also be determined to be not suitable for recreational shooting.

The Forest has no information regarding the popularity of or actual use in any of these areas for recreational shooting. No comments received during the 90-day comment period on the Draft Environmental Impact Statement identified any of these areas as particularly popular for recreational shooting.

The Forest is using qualitative information to determine if recreational shooting is having an impact on others. This information came to the Forest in the form of comments that the noise and safety concerns associated with recreational shooting diminishes the quiet recreational setting that some forest visitors seek.

The Recreation section in the environmental impact statement and the Recreation and Special Areas Specialist Report (USDA Forest Service 2016d) have been updated to provide information on areas that are already closed to recreational shooting under existing rules and regulations. For example, 36 CFR 261.10(d)(1) restricts shooting 150 yards from a residence, building, campsite, developed recreation site, or occupied area. In addition, 36 CFR 261.10(d)(2) restricts shooting across or on a National Forest System road or body of water adjacent to a National Forest System road. The Forest considered these factors and developed a model to estimate how many acres on the Coconino NF may be affected by them. This modeling effort revealed that approximately 216,000 acres on the Forest currently have restrictions on shooting. These restrictions apply under all alternatives. Approximately 62,000 of those acres would also be not suitable under alternative C. Considering the acres where shooting could be restricted by existing regulations and the suitability determination on recreational shooting included in alternative C together, recreational shooting could be impacted on approximately 709,000 acres of the Coconino NF.

Concern Statement #458: The Forest Service should remove the desired condition in the Dispersed Recreation section of the revised plan which implies that blinds, stands, cameras, and other structures brought in by the public have impacts to vegetation and wildlife that are not documented in the Environmental Impact Statement. (75-117)

Response: The Forest Plan has been adjusted to address this comment. This component has been adjusted to have more strategic application and to remove the implication that these particular types of structures may have long-term effects on vegetation and wildlife. As a guideline, this component seeks to ensure that all recreational activities are managed to have minimal user conflicts and to be in balance with the capacity of other resources to support them. See FW-Rec-All-G-2.

Concern Statement #459: The Forest Plan should provide a clear mechanism for reporting disturbances caused by the recreational shooting activities of other forest visitors. (56-191)

Response: Specific methods for reporting disturbances associated with recreational shooting have not been added to the plan. The plan provides a framework that will guide decisions on specific topics like this. Minimal user conflicts is a desired condition and addressed in a guideline. See FW-Rec-All-DC-6 and FW-Rec-All-G-2. The Forest Plan also seeks to have visitors that are well-informed through a variety of strategically located interpretive facilities and/or efforts, including information boards. See FW-InterpEd-DC-1, 2, and 3.

Concern Statement #483: The Forest Plan should encourage collaboration on trail planning with counties, cities, and area residents. (67-10)

Response: The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. A desired condition in the Trails and Trailheads section seeks to establish a trail system that is harmonious with neighboring lands and trail systems through logical connections that expand recreational opportunities. See FW-Rec-Trails-DC-1. A management approach in the Trails section addresses working with stakeholders on trail planning forestwide. It states:

> Collaborate with county and city trails coordinators, local groups, and area residents, when conducting trail planning. Consider needs for non-motorized and motorized trails and provide opportunities for both.

These plan components address the concern expressed in the comment without unnecessarily restricting the collaboration to the Fort Tuthill area or a particular user group.

Concern Statement #486: The Forest Service should modify a management approach in the Sedona Neighborwoods Management Area to remove the implication that hunting regulations are developed collaboratively. This management approach should also be adjusted to apply forestwide. (75-131)

Response: The Forest Plan has been adjusted in response to this comment. Because this management approach has much broader applicability than the Sedona Neighborwoods Management Area, it has been moved to the forestwide All Recreation section of the Forest Plan, where it states:

> Collaborate with the Arizona Game and Fish Department, local law enforcement, and other stakeholders to address issues and opportunities related to recreational shooting on the Coconino NF.

Concern Statement #498: The Forest Plan should prohibit dispersed camping within three miles of the south rim of Walnut Canyon to reduce the risk of accidental wildfire ignitions that could threaten the Walnut Canyon National Monument. (61-4)

Response: The Forest Plan has been adjusted in response to this comment. The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. It does not contain project and activity decisions such as prohibiting dispersed camping in particular areas.

However, in response to this comment, a guideline has been added to the Walnut Canyon Management Area section. It requires all activities in the management area to be managed to protect cultural sites and to preserve habitat for disturbance-sensitive species both on the Forest and within Walnut Canyon National Monument. See MA-Walnut-G-1. A forestwide Dispersed Recreation desired condition also guides future decisions on this topic. See FW-Rec-Disp-DC-3.

There are management approaches in the Fire Management section regarding coordinating with other jurisdictions on prescribed and wildland fires. They read:

> In all ROS classes and in wilderness, prescribed fire and wildfires managed for resource objectives can be appropriate tools to treat and restore vegetative composition, structure, and function where fire is a primary natural disturbance.
>
> Coordinate with other jurisdictions such as communities, service providers (infrastructure), and Federal, State, county, and local entities regarding prevention, preparedness, planned activities, and responses to wildland fires. Notify the above regarding the upcoming and ongoing fire season and any prescribed fire activity.
>
> Coordinate access for initial attack and suppression activities with responsible jurisdictions to reduce response times and address public and firefighter safety.
>
> Encourage the development and implementation of community wildfire protection plans to promote public safety and to reduce the risk of wildfire on lands of other ownership.

Concern Statement #565: The Forest Plan should be adjusted to use the term "structures," not "features," in the management approach related to single-use trails (see Draft Revised Plan

Dispersed Recreation Management Approaches). A trail structure would mean a rolling grade dip or tread armoring. A feature would imply a jump or other rideable "stunt." (67-8)

Response: The Forest Plan has been adjusted in response to this comment. As part of the reorganization of the plan components in the Recreation section, this management approach was moved in the Trails and Trailheads section. The term "features" was removed so that the management approach now strategically refers to "trail design," which could be modified by "structures" or "features" as appropriate for the situation. It reads:

> In general, multi-use trails are preferred, though single-use trails may be considered where trail design cannot mitigate user conflicts or provide for sustainable recreation settings between multi-use types.

Concern Statement#570: The Forest Plan should require improvement of management on existing trails on the Forest before any new trail systems can be considered. (56-158)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan creates a framework for managing the trail systems on the Forest. See the plan components in the Trails and Trailheads section. Improving management on an existing system may involve the need to create new trails that might reduce or eliminate ecological impacts or user conflicts. These decisions are made at the project level based on site-specific information.

Concern Statement #574: The Forest Plan should acknowledge a wide range of recreational values in the Sedona-Oak Creek area. (67-12)

Response: The Forest Plan accommodates a wide range of recreational values in the Sedona-Oak Creek area and across the rest of the Forest. Providing a broad spectrum of developed and dispersed recreation settings is a forestwide desired condition. See FW-Rec-All-DC-4. Some of these recreation settings are to be undeveloped and offer opportunities for primitive character, challenging access, and solitude while other settings are to offer opportunities for more developed infrastructure, easier access, higher levels of social interaction, and increased user comforts. See FW-Rec-All-DC-4. Furthermore, the Red Rock, House Mountain, Sedona Neighborwoods, and Oak Creek Management Areas include desired conditions that acknowledge a wide range of recreational activities in these areas. See SA-RedRock-DC-2, 3, and 4, MA-HouseMtn-DC-2, MA-SedN-DC-1 and 2, and MA-OakCrk-DC-3 and 6.

Concern Statement #575: The Forest Plan should recognize the recreational opportunities available in the Beaver Creek area. (68-2)

Response: The Forest Plan has been adjusted in response to this comment. Additional information has been added to the Verde Valley Management Area section that emphasizes the resources and opportunities in this area, which includes the Beaver Creek community. In addition, as a reminder to forest managers, the Beaver Creek Vision 2020 document has been referenced in the Verde Valley Management Area section in appendix D, Other Sources of Information.

Concern Statement #576: The Forest Plan should include direction to mitigate impacts to trails and scenery caused by projects and management activities. (67-6)

Response: The Forest Plan contains direction related to impacts on trails and scenery caused by projects and management activities. In addition, project-level planning includes opportunities to incorporate specific mitigation measures to reduce or eliminate effects to resources including trails and scenery as appropriate.

The forestwide All Recreation, Trails and Trailheads, Scenic Resources sections and the National Trails section have numerous desired conditions that address desired outcomes of visitation and management

activities on trails and scenery in the Forest. These include FW-Rec-Dev-DC-3, FW-Rec-Trails-DC-4 and 11, FW-Scenic-DC-1, 2, 3, 4, 5, 7, 8, 9, and 10, and SA-NatlTrails-DC-1. In addition, there are desired conditions for trails that ensure the development level is appropriate to the recreation opportunity spectrum so that potential conflicts are avoided at the onset of construction. There are also desired conditions that development scales be appropriate to the scenery setting. See FW-Rec-Dev-DC-6, FW-Rec-Trails-DC-2 and 3, FW-Scenic-DC-7, 8, and 9, SA-NatlTrails-DC-2. Scenery also has a standard to maintain or improve scenic integrity objectives, FW-Scenic-S-1, and an objective to rehabilitate 25,000 acres that do not meet the desired scenic integrity objectives, FW-Scenic-O-1. A guideline in the Trails and Trailheads section requires trails to consider user experience when designing, building, rerouting, or maintaining a trail. See FW-Rec-Trails-G-1. This plan component will guide projects that may propose to convert roads to trails. For example, a guideline in this section addresses how projects should handle evidence of locating slash piles. See FW-Scenic-G-3.

In addition to the recreation and scenery sections of the plan, there is also direction for trails in minerals and special uses regarding management activities. See FW-Minerals-G-3 and FW-SpecUse-S-2.

Concern Statement #580: The Forest Plan should include a management approach to enter into partnerships to develop transportation solutions that reduce traffic and vehicle impacts at high impact recreation areas in the Beaver Creek area. (99-10)

Response: Two management approaches have been added in the Verde Valley Management Area in response to this comment. These management approaches remind forest managers to:

> Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trail head planning and construction efforts.
>
> Work with stakeholders to develop collaborative solutions to problems that arise from high use recreation.

Concern Statement #581: The Forest Plan should include direction that ensures unneeded trails are eliminated and the areas are rehabilitated. (74-94)

Response: The Forest Plan has been adjusted in response to this comment. The direction to discourage unneeded nonsystem trails has been strengthened to require that unplanned, user-created trails be managed to prevent future access. See FW-Rec-Trails-G-3. This guideline also addresses resource damage and requires rehabilitation to accelerate recovery and to prevent further resource impacts. This guideline has been moved into the Trails section to expand its applicability from the management area to the entire forest.

Concern Statement #583: The Forest Plan should adopt the Best Management Practices for Off-Road Vehicle Use on Forestlands: A Guide for Designating and Managing Off-Road Vehicle Routes (January 2008) that were developed by Wildlands CPR and Wild Utah Project. (56-175)

Response: The Best Management Practices for Off-Road Vehicle Use on Forestlands developed by Wildlands CPR and Wild Utah Project have not been adopted by the Forest Plan. This document refers to the best management practices that occur in policy and handbook direction. Best management practices from other sources, as well as suggestions for design features and mitigations are considered at the project level under best available science.

<u>Concern Statement #584:</u> The Forest Plan should contain details on how and when the Forest will achieve the desired conditions for dispersed recreation along with the associated enforcement and monitoring. (56-143)

<u>Response:</u> The desired conditions for Dispersed Recreation, like the desired conditions for all other resources, will guide how activities and uses authorized under the Forest Plan are designed and authorized. Desired conditions are aspirational and it is acknowledged that they may only be achievable over a long time frame. There is no specific date by which they are to be achieved.

However, as described in the Plan Content section in chapter 1 of the Forest Plan, projects and site-specific activities "must be consistent with desired conditions...." The following information has been added to the discussion on desired conditions in the Plan Content section to clarify the ways site-specific projects can demonstrate consistency with desired conditions:

> To be consistent with the desired conditions of the plan, a project or activity, when assessed at the appropriate spatial scale described in the plan (e.g., landscape scale), must be designed to meet one or more of the following conditions:
>
> - Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
> - Be neutral with regard to progress toward plan desired conditions; or
> - Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
> - Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.

One of the ways that forest plans promote progress toward achievement of desired conditions is through the identification of objectives. The objectives in the Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded should the opportunity arise. Objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

For example, the Forest Plan contains a recreation objective in the Trails and Trailheads section to develop or modify 2 to 8 systems of sustainable designated bike trails, equestrian trails, and/or motorized trails to adequately provide for these user groups and reduce conflicts between user groups. See FW-Rec-Trails-O-1. These new or modified trail systems would help move the Forest toward the Trails and Trailheads desired conditions of providing opportunities for visitors to explore the Forest and surrounding areas on a variety of trail types and settings. See FW-Trails-Disp-DC-1 and 2. These new or modified trail systems would also help move the Forest toward the Dispersed Recreation desired condition of offering a variety of settings and challenges for a broad range of recreational opportunities in all seasons. See FW-Rec-Disp-DC-1.

Enforcement is not a forest plan component, but is a requirement of the agency, regardless of the land management plan in effect. The level of Forest Service law enforcement is dependent on staffing, which is reflective of the budget allocated to the Forest Service from Congress.

At the forest level, dispersed recreation monitoring is primarily provided through the National Visitor Use Monitoring surveys that occur every five years. These include "general forest area" visitor surveys (akin to dispersed recreation) across the Forest. The survey results provide forest-level information about recreation activities, demographics, visitation estimates, satisfaction and economics that are useful in planning management strategies.

Concern Statement #589: The Forest Plan should require that on trails where there is high user conflict and resource damage or safety concerns the activity causing the resource damage or creating the safety concern should be removed from the high conflict area. (56-168)

Response: The Forest Plan provides strategic guidance on managing user conflicts. Minimal user conflict is an All Recreation desired condition in the forestwide Recreation section. See FW-Rec-All-DC-6. A guideline in the same section of the Forest Plan requires recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. A modified Trails and Trailheads guideline in the forestwide Recreation section effectively addresses the potential for motorized and non-motorized user conflicts by requiring user experience to be considered when trails are being designed or re-routed. See FW-Rec-Trails-G-1.

Decisions to close a trail or an area to a particular recreation activity are made at the project level based on site-specific information.

Concern Statement #612: The Forest Plan should prohibit the use of volunteers on trails projects to reduce the appearance of unethical collaboration. (27-6, 56-138)

Response: No change has been made in response to this comment. An underlying implication of this comment is that the use of volunteers on a trails project indicates that the action is only beneficial to the volunteers and may be contrary to sound forest management. Trails projects, like all projects, must be designed to be consistent with the plan components in the Forest Plan and laws, regulations, and policies. Who provides the labor for implementing these projects, whether by Forest Service employees, contractors, volunteers, or a combination of these resources, should have no bearing on whether a project is meeting its intended purpose and is consistent with the Forest Plan and laws, regulations, and policies.

Relying upon and making opportunities available for, volunteers is an important component of the Forest Plan as indicated by the numerous references to volunteers and volunteerism throughout the Forest Plan. Volunteer efforts support critical programs on the Forest and foster a sense of stewardship for the Forest.

Concern Statement #636: The Forest Plan should encourage collaboration with the unincorporated communities to consider their needs for recreational opportunities in their respective areas. (68-1)

Response: The Forest Plan has been adjusted in response to this comment. A management approach has been developed for the All Recreation section that reminds forest managers to:

> Collaborate with State and Federal agencies including National Park Service, Arizona State Parks, and Arizona Game and Fish Department; concessionaires; chambers of commerce; nonprofit organizations; Northern Arizona University; State, city and county governments; recreation stakeholders; local communities and citizens; partners; and volunteers regarding provision of recreation opportunities in northern Arizona and communicating these to the public. Work in partnership to find creative solutions to operate and maintain recreation sites, trails and trailheads, and provide interpretive and environmental education. Determine gaps and overlaps in opportunities and resolve conflicts between users, and providers. Work together to determine activities that increase our capacity to serve a diverse population while promoting social, economic, and natural resource sustainability.

Concern Statement #648: The Forest Plan should acknowledge that wildlife viewing occurs in a variety of settings, from wilderness to highly developed. (75-118)

Response: The Forest Plan has been adjusted in response to this comment. A desired condition in the All Recreation section recognizes that wildlife-based recreation takes place in a variety of settings, from highly developed to primitive. The See FW-Rec-All-DC-8.

Concern Statement #649: The Forest Plan should prohibit recreational shooting near trails and provide special places for gun shooters far from trails. (107-2)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions, such as prohibiting shooting near trails or designating special areas for recreational shooting. However, the Forest Plan does contain several components that provide a framework to manage recreation encounters. The All Recreation section identifies minimal user and resource conflicts as a desired condition. See FW-Rec-All-DC-6. The All Recreation section includes a guideline for recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. Specific determinations on whether and how to address conflicts between trail users and recreational shooters would be done through future project-level decision making based on site-specific information.

Concern Statement #650: The Forest Plan should provide direction on trail etiquette. (47-3)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. However, the Forest Plan does contain several components that provide a framework to manage recreation encounters. The Interpretation and Education section includes a desired condition that visitors are well-informed, especially on environmental ethics. See FW-InterpEd-DC-1 and 4. The Interpretation and Education section includes a desired condition for information boards to provide visitor information on, among other things, ethics. See FW-InterpEd-DC-3. A guideline in the Interpretation and Education section indicates that trailhead interpretive information should identify the types of designated trail uses (e.g., motorized, mechanized, equestrian, etc.) to reduce user conflicts. See FW-InterEd-G-3. The All Recreation section includes a guideline for recreational activities, locations, and/or settings to be managed to have minimal user conflicts. See FW-Rec-All-G-2. Specific determinations on how and where to address trail etiquette would be done through future project-level decision making based on site-specific information.

Concern Statement #652: The Forest Plan should provide direction to manage trails based on desired experience, sustainable construction and maintenance, and suitability for the desired conditions of the area. (72-3, 72-4)

Response: The Forest Plan contains direction that addresses this comment. A guideline in the Trails and Trailheads section requires trails and trailheads to be designed, built, rerouted, or maintained utilizing current best practices that promote sustainable trail surfaces, prevent conflicts with neighboring lands, address impacts to other resources, and consider user experiences. See FW-Rec-Trails-G-1. Furthermore, a guideline in the All Recreation section requires recreational activities, locations, and/or settings to be designed and managed to maintain or move toward desired conditions for other uses and resources. See FW-Rec-All-G-1.

Concern Statement #660: The Forest Service should develop and recognize a trail system between Cornville and Beaver Creek and other communities in the Verde Valley. (104-1)

Response: The Forest Plan has been adjusted in response to these comments. The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not decide whether to establish any new trails or trail systems. However, desired conditions have been added to the Verde Valley Management Area that guide trail system design. These components acknowledge a desire

for easy access to the Forest and an interconnected trail system that connects with State, county, and community trail systems. See MA-VerdeV-DC-2 and 3. Several management approaches have been added to the Verde Valley Management Area to remind forest managers to:

Collaborate with organizations and groups such as Arizona State Parks (including the Arizona State Park Off Highway Vehicle Program, Yavapai County), local organizations and groups, such as the Beaver Creek Trails Coalition, Beaver Creek Kiwanis Club, and the Montezuma Homeowners Association, during non-motorized and motorized trail and trailhead planning and construction efforts.

Work with stakeholders to develop collaborative solutions to problems that arise from high-use recreation.

Collaborate with the Montezuma Castle National Monument Staff to better meet visitor needs and protect resources in the vicinity of Montezuma Castle and Montezuma Well.

Collaborate with Arizona State Parks to better meet visitor needs and protect resources in the vicinity of Deadhorse State Park.

Concern Statement #677: Easy hiking trails are the best for me. (101-1)

Response: Thank you for your comment. Having a variety of trail types and levels of challenge for a diversity of users within a variety of settings is a Trails and Trailheads desired condition. See FW-Rec-Trails-DC-2.

Concern Statement #664: The Forest Plan should designate a relatively accessible and sustainable area for beginning mountain bike courses. (47-2)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not designate areas for beginning mountain bike training. Specific determinations on whether to designate an area for beginning mountain bike education could be done through future project-level decision making based on site-specific information. A project considering the designation of such an area would be guided by several components in the Forest Plan. For example, a desired condition in the All Recreation section seeks to provide a broad spectrum of developed and dispersed recreation settings. These settings would range from undeveloped (offering opportunities for primitive character, challenging access, and solitude) to more developed (offering easier access, higher levels of social interaction, and increased user comforts). See FW-Rec-All-DC-4.

Concern Statement #757: The Forest Service should not suggest that bicycle use on trails results in higher levels of erosion or greater impacts to vegetation than hiking. Furthermore, the Forest Service should adopt the approach in Alternative D of restricting bicycle use to designated trails in botanical and geological areas rather than generally determining that these areas are not suitable for mechanized travel. (67-5, 72-10)

Response: The Coconino NF agrees that higher levels of erosion and impacts to vegetation associated with bicycle use is not a problem when bicycles remain on the constructed trail tread. In this situation, there does not appear to be an appreciable difference between the impacts for varying user groups. The analysis regarding the impacts of bicycle use on trails in the environmental impact statement was intended to reference the impacts that occur when bicycles go off the trail tread, impacting resources adjacent to the trail and widening the trail prism. This can be a particular problem on corners on trails or steep, windy trail sections, where cyclists sometimes go off the constructed trail tread to accommodate turning and maintaining high speeds. These are the types of problems being observed on the Lime Kiln Trail. The

references to impacts from bicycle use in the environmental impact statement have been reviewed and adjusted to reflect these points.

In response to comments on the Draft Revised Plan, the suitability determination from alternative D was incorporated into the Forest Plan. Like alternative D, the Forest Plan generally considers mechanized travel to be not suitable in botanical and geological areas, except on designated trails.

Concern Statement #661: The Forest Service should move extreme use activities, like mountain biking and motorized ATV use, to forest lands better suited to the impacts associated with those activities. (47-1)

Response: The Forest Plan provides the framework that would guide site-specific consideration of these activities. The Forest Plan provides desired conditions for the full array of ecological resources on the Forest. A guideline in the All Recreation section requires recreational activities and locations to be designed and managed to maintain or move toward desired conditions for these other resources. See FW-Rec-All-G-1.

Whether these activities are impacting desired conditions in a particular area and how to manage these activities is a site-specific decision. The identification of specific prohibitions on mechanized and motorized travel would be considered in future project-level decisions, including implementation of the Travel Management Rule (36 CFR §212).

Concern Statement #663: The Access Fund would like to participate in projects that involve climbing resources. (70-2)

Response: Thank you for your interest in projects on the Coconino NF involving climbing resources. The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not make decisions on climbing resources in specific areas. The Forest Plan provides the framework that would guide site-specific consideration of climbing resources. For example, an All Recreation desired condition seeks to provide a broad spectrum of developed and dispersed recreation settings, ranging from undeveloped (which offer opportunities for primitive character, challenging access, and solitude) to more developed (which offer easier access, higher levels of social interaction, and increased user comforts). See FW-Rec-All-DC-4.

The Forest Plan also includes a management approach in the All Recreation section that reminds forest managers to:

> Collaborate with State and Federal agencies including National Park Service, Arizona State Parks, and Arizona Game and Fish Department; concessionaires; chambers of commerce; nonprofit organizations; Northern Arizona University; State, city and county governments; recreation stakeholders; local communities and citizens; partners; and volunteers regarding provision of recreation opportunities in northern Arizona and communicating these to the public. Work in partnership to find creative solutions to operate and maintain recreation sites, trails and trailheads, and provide interpretive and environmental education. Determine gaps and overlaps in opportunities and resolve conflicts between users, and providers. Work together to determine activities that increase our capacity to serve a diverse population while promoting social, economic, and natural resource sustainability.

Concern Statement #665: The Forest Plan should acknowledge that hunting and fishing are recreational activities that occur on the Forest. (75-108)

Response: The Forest Plan has been adjusted in response to this comment. The General Description for the Dispersed Recreation section has been edited to acknowledge that hunting and fishing are recreational

activities that occur on the Forest. The Dispersed Recreation section also includes a desired condition that seeks to provide abundant and high-quality opportunities for hunting, fishing and other wildlife-based recreation opportunities. See FW-Rec-Disp-DC-5.

Concern Statement #668: The Forest Plan should give the same level of attention to hunting and fishing as it does to other recreational pursuits. (75-29)

Response: The Forest Plan has not been changed in response to this comment. The Forest Plan has a strategic approach to recreation in general, which includes hunting and fishing, and has desired conditions that would promote a variety of recreational experiences, opportunities, and settings. See FW-Rec-All-DC-2, 4, 6, 8 and FW-Rec-Disp-DC-1. Hunting and fishing are specifically mentioned in FW-Rec-Disp-DC-5 which reads:

> The Coconino NF provides abundant and high-quality opportunities for hunting, fishing and other wildlife-based recreation opportunities.

Concern Statement #669: The Forest Plan should consider how hunting and fishing are often integrally linked with motorized recreation. (75-109)

Response: The Forest Plan has not been adjusted in response to this comment. The glossary in the Forest Plan defines dispersed recreation in conjunction with roads, trails, and undeveloped waterways, including hunting and fishing. The Forest Plan ties motorized use with big game retrieval in standards in the Dispersed Recreation and Roads and Facilities sections, where the motorized vehicle use map is referenced. See FW-Rec-Disp-S-1 and FW-RdsFac-S-1. This map is associated with the Travel Management Rule. The environmental analyses associated with the Travel Management Rule, and subsequent updates to the map, are the primary vehicle for addressing motorized use. The Forest Plan takes a more strategic approach to hunting, fishing, and motorized use. For example, it describes a broad range of recreational opportunities being available on the Forest and has a desired condition that wildlife-based recreation occurs in a variety of settings from primitive to developed. See FW-Rec-All-DC-2 and 8.

Concern Statement #735: The Ecological Sustainability Report released by the Coconino NF in 2010 indicates illegal shooting is outside of the Forest's management authority. This is in contradiction to Alternative C included in the Draft Environmental Impact Statement that was released in 2013 which includes a proposal to determine that over 570,000 acres on the Coconino NF would not be suitable for recreational shooting. (73-3)

Response: Illegal shooting and recreation shooting are not the same thing. The Ecological Sustainability Report defines illegal shooting as:

> Shooting that involves illegal species, weaponry, season, location, etc. Law enforcement is the responsible entity and jurisdiction varies depending on the individual violation.

The Ecological Sustainability Report (USDA Forest Service 2009a) indicates that illegal shooting is, by nature of its illegality, a law enforcement matter, and therefore, illegal shooting is outside of the Forest's management authority. Furthermore, the Ecological Sustainability Report confined its discussion of illegal shooting to the illegal shooting of Mexican gray wolves.

As described in chapter 2 of the Draft Environmental Impact Statement, one of the elements of alternative C would be a determination that over 570,000 acres on the Coconino NF would not be suitable for recreational shooting. Recreational shooting is not the same thing as “illegal shooting” or hunting (the use of firearms while legally pursuing wildlife during an open hunting season). This proposal was developed based on public comments that recreational shooting can cause noise and disturb other different recreation

activities and settings. This proposal is not related to the threat of the illegal shooting of Mexican gray wolves discussed in the Ecological Sustainability Report.

Alternative C was developed, in part, to address this concern and similar concerns regarding human-related disturbance. To that end, alternative C proposes to determine the suitability of recreational shooting in various parts of the Forest. The portions of the Forest identified as not suitable for recreational shooting under alternative C were in the following areas: botanical areas; geological areas; existing and recommended research natural areas; wildlife habitat management areas (which have been renamed in the Final Environmental Impact Statement); and in the Walnut Canyon, Sedona Neighborwoods, and Long Valley Management Areas, and parts of the Flagstaff Neighborwoods Management Area.

If alternative C were selected, a determination in the Forest Plan that an area is not suitable for recreational shooting would not be a decision to prohibit recreational shooting in that area. Rather, such a determination would guide projects in the future that would need to be consistent with the suitability determination or propose an amendment to the Forest Plan. These project-level decisions would be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual, would include analysis and opportunity for public involvement, and would apply site-specific information. Through this process, a decision would be made on whether to restrict recreational shooting in a specific area and if so, under what conditions.

Concern Statement #744: The Forest Service should place greater emphasis on the economic and recreational value of hunting. The Forest Service should use information on expenditures by hunters in its economic analysis. Furthermore, the Forest Service should acknowledge that drought in recent years has impacted wildlife populations, which has resulted in a corresponding reduction in hunter recreation days over the same time period. (64-27, 64-28, 77-3, 94-3)

Response: Recreational activities, including hunting, are addressed in the Recreation and Socioeconomic sections in the environmental impact statement. In the Recreation analysis, specific recreational activities are only highlighted when a particular plan component or alternative may have a unique impact on that activity. This is true of how the environmental impact statement addressed hunting. Looking at recreational activities as a group rather than focusing on its individual elements is part of the forest plan revision effort to develop a more strategic forest plan.

Additional information on hunting is included in the Socioeconomic section in the environmental impact statement. The Socioeconomic section provides a breakdown of the types of activities visitors to the Coconino NF participate in and the relative levels of participation. Although the specific economic value of hunting is not singled out, hunting was considered when the economic value of recreation on the Coconino NF was calculated.

To measure the value of economic activity associated with recreation on the Forest, the Coconino NF used employment and labor income. Simply reporting expenditures does not give an accurate portrait of local economic consequences. Many of these expenditures will not meaningfully contribute to local economic activity. For instance, a $50 purchase of gasoline or groceries by a recreation visitor will not contribute $50 to local economic activity, since most of the value, and associated impacts, of that purchase occur outside the local area (e.g., in distant oil extraction sites, refineries, and trucking companies). Reporting the employment and labor income attributable to recreation visitor expenditures more accurately estimates the local economic consequences of Forest Service management activities, since it considers what share of the expenditures cycle through the local area, rather than leaking out to other parts of the United States or overseas.

The Forest is not aware of any reduction in hunter recreation days associated with an ongoing drought. The Forest acknowledges that it has been experiencing drier than normal conditions over the last 10 or so

years. However, according to the Arizona Department of Game and Fish, elk, mule deer, white-tailed deer, and pronghorn populations on the Forest have not meaningfully changed over that time frame nor have the number of elk hunting permits, which drive the majority of hunter recreation days on the Forest.

Concern Statement #753: The Forest Service should clarify why it used the presence or absence of recreational shooting as a topic for comparing alternatives. (75-136)

Response: One of the issues that the public identified with the proposed revised plan stemmed from recreational shooting and the noise and disturbance it can cause to other different recreational activities and recreation settings. See the Issues section in chapter 1 of the Final Environmental Impact Statement. To address this issue, the Forest included a suitability determination on recreational shooting in alternative C.

To compare how alternative C addressed recreational shooting in relation to the other alternatives, the Forest identified the topic of the presence or absence of recreational shooting opportunities. Acres of the Forest and percentage of the Forest were chosen as measurement indicators. Using this topic and these indicators, the Forest was able to display that alternative C's suitability determination on recreational shooting would likely result in more areas on the Forest where recreational shooting would not cause noise or disturb other different recreational activities and recreation settings.

Concern Statement #762: The Forest Service should comply with the 2006 Federal Lands Hunting, Fishing and Shooting Sports Roundtable Memorandum of Understanding (MOU) and provide private organizations timely explanations of changes in land management plans that would impact access or opportunities for shooting sports activities on Federal lands. Furthermore, private organizations should be included on public involvement lists for proposed land management plan revisions that would impact access or opportunities for shooting sports activities on Federal lands. (73-9)

Response: The Coconino NF has complied with the MOU. There has been no change to the Coconino NF's land management plan related to recreational shooting. As part of the forest plan revision process, the Forest has developed a proposed revised plan (referred to as alternative B (modified) in the environmental impact statement) and three alternatives. The Forest provided updates on forest plan revision progress in fall 2011, winter 2012, and fall 2013, reporting that alternatives were being developed to the proposed revised plan. The fall 2013 update provided some details on the alternatives that had been developed, specifically stating that under alternative C recreational (non-hunting) shooting would not be suitable in botanical areas, geological areas, research natural areas, and in areas around Walnut Canyon, Sedona, Long Valley, and Flagstaff. The Forest developed alternative C in response to public comments on the proposed revised plan. Alternative C and three other alternatives were analyzed in the Draft Environmental Impact Statement that was distributed in December 2013. A 90-day comment period was provided on the proposed revised plan and the other alternatives analyzed in the Draft Environmental Impact Statement. The updates and the Draft Environmental Impact Statement provided timely explanations of potential changes in the Coconino NF's land management plan. None of the alternatives would result in immediate closures to recreational shooting. Specific decisions on whether and how to address recreational shooting in specific areas would be done through future project-level decision making based on site-specific information.

The fall 2011, winter 2012, and fall 2013 updates mentioned above, as well as the Draft Environmental Impact Statement, were sent directly by mail or email to organizations and individuals who had previously requested to receive this information. The mailing list used for the updates and Draft Environmental Impact Statement has been developed over the years of public involvement on this forest plan revision effort. In addition to sharing this information by mail and email, the Forest posted these documents to its website.

The commenter has been added to the project mailing list and will receive updates and other correspondence related to this forest plan revision effort.

Concern Statement #770: The Forest Service should clarify whether the recreational shooting suitability determination that has been included in Alternative C is designed to address noise or safety. (73-8)

Response: No change has been made in response to this comment. The recreational shooting suitability determination included in alternative C is designed to address concerns about both noise and safety. The Issues section in chapter 1 of the environmental impact statement includes information on Recreation Issues. One of the Recreation Issues lists a concern that recreational shooting "may cause noise and disturb, other recreational activities and recreation settings." This statement summarizes the concerns regarding the proposed revised plan that were raised by members of the public. Reducing a forest visitor's sense of security or safety is one of the ways that recreational shooting can disturb other, different recreational activities and recreation settings.

Riparian – Wetlands

Concern Statement #64: The Plan should include special provisions for the ecological integrity and function of riparian areas. (84-33)

Response: The Forest Plan has numerous desired conditions that relate to the ecological integrity and function of riparian areas, stream banks, flow regimes, and other features of aquatic habitat. See FW-Eco-DC-1, 3; FW-Water-DC-1 to 7, FW-Rip-All-DC-1 to 5; FW-Rip-Strm-DC-1 to 4; FW-Rip-Wtlnds-DC-1, 2; FW-Rip-Spr-DC-1 to 5; FW-Rip-RipType-DC-1 to 6; FW-WFP-DC-4, 5, 6.

Guidelines that specifically apply to functioning aquatic and riparian ecosystems include: FW-Water-G-1 to 6; FW-Rip-All-G-2; FW-Rip-Strm-G-1; FW-Rip-Spr-G-1 to 4, FW-Rip-RipType-G-1, FW-WFP-G-3, and FW-RdsFac-G-5 and 9.

In addition there are objectives in the plan to restore wetlands, springs, non-functioning and function-at-risk riparian areas, and stream habitat. See FW-Rip-Wtlnds-O-1; FW-Rip-Spr-O-1, FW-Rip-RipType-O-1, and FW-WFP-O-4.

In regard to areas near the edge of perennial water, an aquatic management zone is required to protect water quality and to avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. As a general starting point, the zone width in riparian areas ranges from 100 to 150 feet on each side of the streamcourse or riparian area depending on erosion hazard (See FW-RipAll-G-3). A management approach for All Riparian Areas recommends project-level analysis to determine whether the zone should be wider or narrower. It reads:

> Consider table 1 as a general starting point for determining the width of the aquatic management zone relative to erosion hazard. Aquatic management zones may be wider or narrow than suggested in Table 1 and would be decided at the project level. Considerations for the size and shape of an aquatic management zone include amount and type of material on the ground, width and slope of the zone, soil type or hydrologic soil group, orientation of stream or river to the sun, connection of stream to impaired or non-attaining waters, presence of threatened or endangered species, condition of the riparian area, adjacent land use, and threat of contamination from pollutants or chemicals. Significant topographic changes, such as abrupt canyon edges may be used as boundaries for aquatic management zones, as long as activities beyond the canyon walls do not negatively influence the functioning of the aquatic management zone.

Because non-riparian streamcourses could also negatively affect perennial waters, an aquatic management zone is also required for non-riparian, intermittent streamcourses to reduce sedimentation, maintain functioning of the channel within its floodplain, and maintain downstream water quality and riparian habitat and function. This management zone would also avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. See FW-Rip-Strm-G-2. The Stream Ecosystems section includes a management approach similar to the one in All Riparian Areas, but in addition, it mentions consideration of ephemeral streamcourses that might influence downstream water quality. In addition, a site-specific aquatic management zone would be required for new projects and management activities around reservoirs to protect water quality and to avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions or aquatic habitat. See FW-ConstWat-G-1.

Concern Statement #111: The Forest Service should have an actual plan for achieving the desired conditions for riparian areas. (81-3)

Response: The desired conditions for riparian areas, like the desired conditions for all other resources, will guide how activities and uses authorized under the Forest Plan are designed and authorized. Desired conditions are aspirational and it is acknowledged that they may only be achievable over a long time frame. There is no specific date by which they are to be achieved.

However, as described in the Plan Content section in chapter 1 of the Forest Plan, projects and site-specific activities "must be consistent with desired conditions...." The following information has been added to the discussion on desired conditions in the Plan Content section to clarify the ways site-specific projects can demonstrate consistency with desired conditions:

> To be consistent with the desired conditions of the plan, a project or activity, when assessed at the appropriate spatial scale described in the plan (e.g., landscape scale), must be designed to meet one or more of the following conditions:
>
> - Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
> - Be neutral with regard to progress toward plan desired conditions; or
> - Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
> - Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.

One of the ways that forest plans promote progress toward achievement of desired conditions is through the identification of objectives. The objectives in the Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded should the opportunity arise. Objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

The Forest Plan contains several objectives associated with riparian areas. See FW-Rip-Wtlnds-O-1, FW-Rip-Spr-O-1, FW-Rip-RipTypes-O-1, and FW-WFP-O-4.

Concern Statement #97: The revised Forest Plan should include prohibitions on activities within riparian areas. (56-16, 84-39, 84-44, 84-45)

Response: Riparian areas are protected by Plan direction. The Plan does not apply an all-purpose buffer or restriction on particular activities. Rather, Plan direction ensures that impacts to riparian areas, despite their exact proximity to a riparian area or the cause of the impact, are addressed in project-level decisions. See FW-Rip-All-G-1, 2, and3; FW-Rip-Strm-G-1 and 2; FW-Rip-Sprg-G-1, 3, and 4; and FW-Graz-G-4, 5, and 7.

Concern Statement #109: The Plan should provide protection for springs; at least 50% of springs over the next 10 years and at least 10 springs per year. (64-43)

Response: The Forest Plan includes an objective to restore riparian function on at least 25 springs that are not in proper functioning condition during each 10-year period during the life of the Forest Plan. See FW-Rip-Sprg-O-1. This objective, like the other objectives in the Forest Plan, was established based on recent trends, current and anticipated staffing, and anticipated budgets, and it was balanced against other management needs on the Forest. Objectives can be exceeded should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

The Plan's monitoring strategy establishes monitoring of improvements or restoration to springs.

Concern Statement #110: The Forest Service should assess diversions of water sources that recharge wetlands within five years and take steps to eliminate those effects. (64-45)

Response: Diversions on wetlands are subject to water rights and generally associated with pipelines, dams, spring development, or earthen stock ponds. A water right is a legally defined use of water from a particular source by a particular user. Water right law is complicated and often contentious especially in arid ecosystems.

The Wetland section in chapter 3 of the environmental impact statement discusses how most wetlands on the Forest are generally disconnected from groundwater and are reliant on precipitation for water input. It also discusses how many wetlands have been modified by dams and stock tanks to increase water permanency and these modifications were constructed many years ago and are associated with specific water rights. The Forest Plan has not been adjusted to require the assessment of water diversions of water sources that recharge wetlands and it does not preclude the assessment of water diversions that affect wetlands at the forest, district, or project level. However, with water rights in mind, desired conditions in the Forest Plan would promote functional soil and water resources on most wetland acres, consistent with their flood regime and flood potential. See FW-Rip-Wtlnd-DC-1. Desired conditions for springs: Consistent with existing water rights and claims, springs are rarely developed and altered by human-made structures such as head boxes, cisterns, and pipelines and water rights should be maintained or procured where no water rights exist. See FW-Rip-Spr-DC-4, FW-Rip-Spr-G-2. Desired conditions for water in general:

> Water quality, water quantity, and the timing of water flows support ecological functions, habitat for aquatic and riparian species, and water sources for municipalities. Water quality, water quantity, and the timing of flows are sustained at levels that retain the biological, physical, and chemical integrity of associated systems and benefit survival, growth, reproduction, and migration of native species. See FW-Water-DC-6.

Also, Water guidelines promote best management practices to maintain water quality, quantity, and timing of flows, and to prevent or reduce accelerated erosion. See FW-Water-G-4. Finally, an objective in the section on Wetlands would restore 5 to 10 wetlands currently not in proper functioning condition so that they are in, or are trending toward, proper functioning condition during each 10-year period over the life of the plan. See FW-Rip-Wtlnds-O-1.

Concern Statement #122: The Plan should provide protection for wetlands; at least 50% of wetlands in the next 5 years and at least 75% of wetlands in 10 years. (64-44)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan does not require any particular percentage of wetlands to be "protected." The Forest Plan is programmatic in nature and does not make decisions on whether or how individual wetlands should be protected. Decisions of this nature are made at the project level based on site-specific information. The Forest Plan provides a framework that will guide these project-level decisions in a manner that ensures that wetlands are in or trending toward proper functioning condition. See FW-Rip-Wtlnds-DC-1.

Concern Statement #123: The Forest Service should completely eliminate or minimize the negative impacts of management activities on springs, streams, and wetlands. (64-46)

Response: The Forest Plan addresses impacts to springs, wetlands, and streams in a number of places. There are specific desired conditions in the section for Wetlands that promote functional soil and water resources, diverse habitats for native species, maintenance of riparian soil moisture characteristics; a variety of age classes, and a native species composition that reflects the individual wetland types, such as seasonal wetlands. See FW-Rip-Wtlnds-DC-1, 2. Also, the section on springs describes specific desired conditions for vegetation, soil, and riparian function. See FW-Rip-Spr-DC-1, 2, 3. There is a guideline that requires activities be designed and implemented to maintain or improve soil and riparian function, maintain or improve native vegetation and design features could include livestock management. See FW-Rip-Spr-G-3. Streams would be protected through guidelines that require projects and management activities to be designed and implemented to retain or restore natural streambank stability, native vegetation, and riparian and soil function. See Fw-Rip-Strm-G-1. Aquatic management zones would be required to protect or reduce the impact of activities to non-riparian intermittent streamcourses and to riparian areas. See FW-Rip-All-G-3 and FW-Rip-Strm-G-2. The Roads and Facilities section and the Watersheds and Water section have guidelines to apply soil and water best management practices to protect water quality. See FW-RdsFac-G-5; FW-Water-G-4.

In addition, there are objectives to restore 5 to 10 wetlands currently not in proper functioning condition so that they are in, or are trending toward, proper functioning condition during each 10-year period over the life of the plan; an objective to restore riparian function to at least 25 springs identified as not in proper functioning conditions during each 10-year period during the life of the plan; and an objective to restore or enhance at least 70 miles of stream habitat during each 10-year period. See FW-Rip-Wtlnds-O-1, FW-Rip-Spr-O-1, and FW-WFP-O-4. Finally, there is a guideline in the section of Wildlife, Fish and Plants that requires management activities to be designed and implemented to protect and provide for narrowly endemic species and species with restricted distributions (many of which occur in springs). See FW-WFP-G-10.

The forest plan does not explicitly exclude springs, which includes seeps, and seasonal wetlands, from non-native herbivory; however, no grazing is an option based on site-specific analysis. Livestock use of springs and wetlands is also influenced by existing water rights. Chapter 4 of the plan, Grazing Suitability, shows that 82,322 acres are closed to grazing as a result of signed decisions. Some of these areas include springs and wetlands.

Permitted livestock grazing is intended to be consistent with the desired conditions of other resources; however, the Forest Plan acknowledges that there may be lower levels of vegetation and higher levels of soil compaction immediately adjacent to earthen stock ponds and developed springs where livestock concentrate. See FW-Graz-DC-2, FW-Graz-G-2.

The Livestock Grazing section has specific guidance to protect springs, seasonal wetlands, and other riparian areas such as locating and using structural range improvements and salt, minerals, and/or other supplements in a manner that is consistent with desired conditions for other resources and so that riparian areas and wet meadows are protected. FW-Graz-G-4, 5. See also FW-Rip-All-G-1. There is a specific guideline in Livestock Grazing for when permitted livestock have access to riparian areas, the use on riparian species should provide for maintenance of those species, allow for regeneration of new individuals, protect bank and soil stability, and reduce the effects of flooding. Maintenance of woody riparian species should lead to diverse age classes of woody riparian species where potential for native woody vegetation exists. This guideline would not apply to fine-scale activities and facilities such as intermittent livestock crossing locations, water gaps, or other infrastructure used to minimize impacts to riparian areas at a larger scale. See FW-Graz-G-7.

Concern Statement #124: The Forest Service should revise the cumulative effects analysis in the Water and Riparian Resources section of the environmental impact statement to include discussions of how drought and climate change, along with other human and livestock activities, will likely cumulatively affect water quality and riparian resources over the life of the forest plan based on proposed management strategies. (84-46)

Response: The cumulative effects analysis in the Water and Riparian Resources section of the environmental impact statement has been expanded in response to this comment. In-depth discussions of the cumulative effects of activities or actions occurring on the Coconino NF as well as on non-National Forest System lands have been added to this section in the Final Environmental Impact Statement. Actions considered in the cumulative effects analysis include:

> Activities such as vegetation management, fuels management, livestock grazing, recreational activities, groundwater withdrawal, noxious weeds treatments, and other management activities that have occurred in the past, are occurring, and are reasonably foreseeable actions on or adjacent to the Coconino NF.
>
> Urban development and interface growth that would likely continue on private lands with potential to cumulatively affect NFS lands (e.g., increased groundwater extraction, altered hydrology/flowpaths or changes in runoff patterns, etc.)
>
> Road construction, maintenance, and right-of-way clearing on Forest Service and non-Forest Service lands and the effects that these activities can have on surface water quality and quantity.
>
> The expected increase in recreational use on the Forest, and the potential for future recreation projects that may be developed.
>
> The potential effects of these activities on climate change and the effects of climate change on surface water, groundwater, and riparian resources.

Concern Statement #546: The Forest Plan should address human and livestock disturbances to ensure improvement of impaired and degraded riparian areas. (84-43)

Response: The Forest Plan includes direction that will guide livestock grazing to meet or move toward desired conditions, including desired conditions for riparian areas. See FW-Graz-DC-2, FW-Graz-G-2, and FW-Rip-All-G-1. Similar direction can be found in other sections of the Forest Plan that address

human activities, such as recreation, special uses, roads and facilities. See FW-Rec-All-DC-6, FW-Rec-All-G-1 and 2, FW-SpecUse-G-1, and FW-RdsFac-DC-1, and FW-RdsFac-G-1 and 2.

Plan direction for riparian areas, which include stream ecosystems, wetlands, springs, and riparian forest types, is included in the Riparian Areas section. While there are no standards for management of riparian areas, the plan direction in the Riparian Areas section provides comprehensive direction for these areas.

Soil and water guidelines would implement and monitor best management practices for all activities with the potential to impair water quality; to control and manage nonpoint source pollution and to maintain water quality, quantity, and timing of flows; and to prevent or reduce accelerated erosion. See FW-Soil-G-1 and FW-Water-G-4. Buffers, called aquatic management zones, would be identified and maintained in riparian areas to avoid detrimental changes that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. See FW-Rip-All-G-3. Aquatic management zones would also be established in non-riparian, intermittent streamcourses to maintain channel functioning, downstream water quality, riparian habitat, and function. See FW-Rip-Strm-G-2.

Some of the desired conditions and guidelines that promote resiliency, hydrologic and biotic integrity, natural processes, base flow, riparian communities, groundwater recharge, and species diversity include FW-Water-DC-1 to 7; FW-Water-G-1, 2, 3 and 6; FW-Rip-All-DC-1, 2, 3 and 5, FW-Rip-Strm-DC-1 to 4; FW-Rip-Strm-G-1; FW-Rip-Wtlnds-DC-1 and 2; FW-Rip-Spr-DC-1 to 5; FW-Rip-Spr-G-1, 3, and 4; FW-Rip-RipType-DC-1 to 6; FW-Rip-RipType-G-1 to 4; FW-WFP-DC-3, 4, and 5; FW-Invas-DC-1 and 2; FW-Invas-G-1 and 2; FW-Graz-G-4, 5, and 7; FW-RdsFac-G-5 and 9; FW-Rec-All-G-2; and FW-Rec-Disp-G-5.

Connectivity along streams, across floodplains and valley bottoms, between surface and subsurface flows, and between vegetative communities is supported by desired conditions in Watersheds and Water, All Riparian Areas, Riparian Forest Types, and Wildlife, Fish and Plants. See FW-Water-DC-4; FW-Rip-All-DC-3; FW-Rip-All-G-2; FW-Rip-RipType-G-2; and FW-WFP-DC-6.

Concern Statement #732: The Forest Plan should include additional information on the amount and condition of riparian resources such as wetlands, seeps, and springs and explain why there are still riparian resources in need of restoration. The Forest Service should not rely on partners and stakeholders to inventory, classify, and prioritize springs for restoration. (64-42)

Response: Information on the amount and condition of riparian resources such as wetlands, seeps, and springs in is included in the environmental impact statement that has been prepared to analyze the potential effects of the proposed revised plan and alternatives to that proposal. See the Riparian Resources section in chapter 3 of the environmental impact statement. This section also explains why some of these riparian resources are not in desired condition at this time.

The Forest Plan does include a management approach in the Springs section that reminds forest managers to:

> Continue working with partners and stakeholders, including tribes, to inventory, classify, assess, and prioritize springs and recharge areas for restoration, and to implement restoration activities. Include consideration of rare species and endemic species when evaluating springs for restoration.

Relying upon, and making opportunities available for, volunteers is an important component of the Forest Plan as indicated by the numerous references to volunteers and volunteerism throughout the Forest Plan. Volunteer efforts support critical programs on the Forest and foster a sense of stewardship for the Forest.

Concern Statement #92: The Forest Plan should include a Beaver Creek Management Area with specific direction for the riparian areas located in that management area. (99-9)

Response: The desired conditions for riparian areas have been addressed in forestwide direction. See FW-Rip-All-DC-1 and 5. See also plan components in the forestwide direction for All Riparian Areas Stream Ecosystems, Wetlands, Springs, and Riparian Forest Types.

Although a Beaver Creek Management Area has not been identified as part of the Plan, in response to your comments, the Verde Valley Management Area plan components were reviewed, edited, and augmented. For example, a guideline has been added to the Verde Valley Management Area requiring projects and activities to be designed and implemented in a manner that maintains or improves watershed and riparian function. See MA-VerdeV-G-1.

Roads Management

Concern Statement #102: The Forest Plan should require surveys to be conducted as part of the minimum road system analysis to assess on-going impacts and to determine the continued utility of roads. (56-19)

Response: The Forest Plan has not been adjusted to require surveys be conducted as part of a minimum road system analysis. The Forest Plan provides the framework for road system analyses. The Roads and Facilities section includes a desired condition for the transportation system to expand and contract commensurate with use and needs, and to balance the desire for access with management activities and ecological impacts. See FW-RdsFac-DC-1. As travel management analyses are conducted on the Forest, this desired condition will require consideration of how to address routes that are causing ecological and social impacts. This desired condition will also guide decisions on the construction, reconstruction, or closure of roads that are causing ecological and social impacts. The level of surveying that is necessary will be determined at the project level based on the scope of the project.

Concern Statement #103: In the revised plan, the Forest Service should change a guideline in the section on Roads and Facilities to a standard. As written, this guideline is insufficient to tackle the ongoing problem of sediment pollution from roads. It now reads "Stream crossings on permanent roads should be designed ….." It should be modified to read "Stream crossings on permanent roads shall be designed….." (56-20, 84-49)

Response: Plan language has been adjusted to further address stream crossings, roads and sediment pollution; however, the guideline has not been converted to a standard. Resource protection associated with stream crossings is now strategically addressed in FW-RdsFac-DC-1, FW-RdsFac-G-1, 2, 5, and 9. Whether a drainage structure is "cost efficient" is a site-specific determination.

Concern Statement #112: The Forest Service should disclose the sedimentation and erosion impacts associated with the existing road network, including stream crossings, on water quality. (84-64)

Response: The Watersheds and Water and the Infrastructure and Facilities sections in the environmental impact statement and the Water Quality, Quantity and Watershed Specialist Report (USDA Forest Service 2016e) discuss erosion and sediment delivery into streams from roads, as one factor that could influence water quality. The location and management of any new roads would be addressed in a project-level decision based on site-specific information.

Concern Statement #242: The Forest Plan should include the following desired condition: "Road densities are developed and managed to ensure reasonable and sufficient recreational and multiple use access to accommodate a wide array of uses and users." (75-112)

Response: One of the proposed desired conditions was modified to address this comment. The changes do not particularly emphasize road densities. Specifying road densities is an alternative that was not carried forward for detailed consideration, because road impacts are more complex than a simple road

density calculation. See the Alternatives Eliminated from Detailed Study section in chapter 2 of the Final Environmental Impact Statement for additional information. Rather, the modification to the desired condition focuses on the effectiveness of the transportation system to provide access for a wide variety of needs while protecting other forest resources. See FW-RdsFac-DC-1.

Concern Statement #245: The Forest Plan should provide more specific direction on how certain forest roads should be managed and maintained. (60-1, 60-2, 90-3, 98-1)

Response: The Forest Plan is not the appropriate document in which to classify the maintenance level for specific roads or determine their need for maintenance. Likewise, the Forest Plan does not make specific decisions on traffic management. Rather, the Forest Plan provides direction for the management of the transportation system on the Forest. For example, the Roads and Facilities section includes a desired condition for the Forest to have a well-maintained road system. See FW-RdsFac-DC-1. Decisions on which maintenance level to assign to a road are administrative determinations made as part of the management of the transportation system. Decisions on when and where to conduct maintenance are made based on site-specific information and analysis and appropriated budgets for that activity.

Prioritization of road maintenance planning is outside the scope of the Forest Plan and the plan revision process. Maintenance planning is a requirement of Forest Service Manual 7732.11 that requires the Forest to:

> Develop annual road maintenance plans based on road management objectives and expected traffic for all National Forest System Roads.
>
> Clearly display the allocation of available funds in highest priority order in road maintenance plans in case of funding short falls.

Concern Statement #246: The Forest Plan should include a standard that limits one mile of road per square mile of land. (56-174)

Response: No change was made in response to this comment. Specifying road densities is an alternative that was not carried forward for detailed consideration because road impacts are more complex than a simple road density calculation. See the Alternatives Eliminated from Detailed Study section in chapter 2 of the Final Environmental Impact Statement for additional information.

Concern Statement #317: The Forest Plan should not reduce public access to the Forest or close any roads. The Roads and Facilities objective (see Draft Revised Plan FW-RdsFac-O-1) should be adjusted to require implementation of decisions made under the 2005 Travel Management Rule, not to decommission an additional 200 to 800 miles of roads on the Forest. Likewise, the Forest Service should not adopt the recommended wilderness and changes in Recreational Opportunity Spectrum (ROS) settings proposed in alternative C because they will result in new restrictions on motorized travel and dispersed camping. (49-4, 49-5, 75-32, 75-103, 75-104, 77-7, 94-7, 105-1, 108-1, 109-1)

Response: The Forest Plan is strategic in nature and does not include project and activity decisions. Accordingly, the Forest Plan does not direct or designate routes or areas for motorized travel. Specific access and motorized use determinations would be done through future project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212).

Some commenters have expressed concern with the Roads and Facilities objective that mentions decommissioning 200 to 800 miles of unauthorized and system roads on the Forest. This objective has been adjusted in response to these comments to clarify that the decommissioned roads will not be roads that the motor vehicle use map has identified as open to the public. See FW-RdsFac-O-1. This objective is

aligned with the ongoing travel management effort and is not a decision to create additional, new limitations to motorized use on the Forest.

Other commenters have expressed concern with the potential impact that Recreation Opportunity Spectrum (ROS) classifications and recommended wilderness areas could have on public motorized access. The ROS classifications for alternatives B (modified) and D have 2.6 miles of road that is currently open to public use that would be in the primitive or semi-primitive non-motorized class. Alternative C would have 14 miles of road open to the public that would be in these ROS classes, which were developed taking the additional recommended wilderness areas and management areas in this alternative into account. Alternative B (modified) contains no recommended wilderness areas with roads that are currently on the motor vehicle use map. Alternative C contains six recommended wilderness areas with a total of 10.6 miles of road that are currently on the motor vehicle use map. Accordingly, even if the ROS classifications and recommended wilderness areas are adopted by either alternative, the potential change to public motorized access would be very small.

Concern Statement #427: The Forest Plan should include restrictions on the construction of new roads for access to inholdings. Providing for reasonable access is too broad and subjective of a term. (74-80)

Response: The Forest Plan has been adjusted in response to this comment. The sentence addressing reasonable access to inholdings has been removed from the Land Adjustment desired conditions for two reasons. First, access to neighboring land is addressed in a Roads and Facilities desired condition. See FW-RdsFac-DC-1. The Roads and Facilities desired condition still refers to reasonable access. Reasonableness is determined at the project level based on site-specific information and conditions. Proposals to construct new roads would need to be consistent with the National Environmental Policy Act (NEPA), the Forest Service Handbook and Forest Service Manual, and include analysis and opportunity for public involvement.

Second, the focus of the Land Adjustment desired condition is supposed to be on acquiring access to National Forest System lands through acquisition of easement rights-of-way across lands of other ownership. The desired condition has been adjusted to clarify that intent. See FW-LndAdj-DC-2.

Concern Statement #430: The desired condition in the Roads and Facilities section of the Forest Plan that discusses maintenance of roads under easement (see Draft Revised Plan, FW-RdsFac-DC-3) should be adjusted to reference the conditions of the easement deed agreements and the Four Agency Partnership Guidelines. (83-6)

Response: The desired condition has been adjusted to incorporate the suggestion in this comment. As adjusted, the desired condition has been shifted away from requiring road maintenance requirements to meeting Forest Service standards or the terms of the authorization for the easement or permit. That maintenance is already required by Forest Service policy or the terms of the easement or permit. The adjusted desired condition focuses on designing, constructing, and maintaining roads so they provide safe passage. The details related to individual road maintenance would be determined at the project level based on site-specific information. See FW-RdsFac-DC-2.

Concern Statement #432: The Forest Plan should include direction that ensures the Forest road system is designed to protect scenic integrity. (74-76)

Response: The Forest Plan has been adjusted in response to this suggestion. The Roads and Facilities desired condition has been adjusted to list protection of scenery as one of the goals associated with the Forest transportation system. See FW-RdsFac-DC-1. The Roads and Facilities section also includes a guideline that requires roads to be located, designed, and maintained to move toward or maintain desired

conditions for other uses and resources. See FW-RdsFac-G-1. By this reference to the desired conditions for other resources, this guideline incorporates all of the relevant desired conditions from the Scenic Resources section of the Forest Plan.

Concern Statement #433: The Forest Plan should include plan components that will ensure that forest users clearly understand travel restrictions on the Forest. These plan components should specifically address visitor education and signage related to motorized travel restrictions. (56-145, 56-147, 56-149, 56-167, 74-78, 74-85)

Response: In addition to the desired awareness of travel restrictions included in FW-RdsFac-DC-6, the Forest Plan includes several other components that address this comment. One of the guidelines in the Roads and Facilities section has been expanded to require signage that facilitates navigation of designated motorized routes and prevents motorized use outside of designated areas and routes. See FW-RdsFac-G-3.

Additional direction is located in the Interpretation and Education section. A desired condition in this section creates an express goal to provide forest visitors with properly placed, clearly worded signs and information on authorized motorized use and restrictions. See FW-InterpEd-DC-5. A guideline in this section directs designated trail uses (e.g., motorized, mechanized, equestrian, etc.) to be identified at trailheads to reduce user conflicts, and impacts to trails and associated resources. See FW-InterpEd-G-3. Finally, a management approach is included in the Interpretation and Education section to remind forest managers to work with others to establish interpretive messages and programs for designated motorized routes and areas. It reminds forest managers to:

> Work with agencies, motorized recreation user groups, and other stakeholders to establish interpretive messages and programs for designated motorized routes and areas. These efforts may include improved signs, information kiosks, and other interpretive tools. Interpretive themes may include messages to foster conservation ethics, to prevent lost riders, to show opportunities of where to ride, to identify dangerous and/or closed areas, to teach riding ethics, and to reduce user conflicts.

Concern Statement #434: The desired condition in the Roads and Facilities section of the Forest Plan that addresses the expansion and contraction of the transportation system (see Draft Revised Plan, FW-RdsFac-DC-1) should be edited to recognize the role fiscal realities can play on that expansion and contraction. (56-142)

Response: No change has been made in response to this comment. The second sentence of this desired condition addresses concerns related to fiscal realities by specifically stating a desire for an "economical system of sustainable, well maintained, and marked roads...." See FW-RdsFac-DC-1.

Concern Statement #497: The Forest Plan should extend seasonal road closures through the dry season to reduce the risk of accidental wildfire ignitions. (56-11)

Response: No change has been made to the Forest Plan in response to this comment. Specific road closures are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule.

The Forest has an existing policy and process to address when to close the Forest and ban campfires based on specific existing conditions. Although the Plan does not provide a specific seasonal closure for campfires, it does contain a guideline requiring recreational activities to be managed to promote public health and safety. See FW-Rec-All-G-2. The existing policy and process are consistent with this guideline and can be viewed as an extension of this guideline.

Concern Statement #566: The Forest Plan should include direction on coordination with the Arizona Department of Transportation regarding long-range planning. (83-5)

Response: The Roads and Facilities section of the Forest Plan includes a management approach reminding forest managers to:

> Cooperate with local and regional governments, Federal Highways Administration, and Arizona Department of Transportation on the planning, design, construction, and maintenance of highway corridors.

A reference to the Amended Memorandum of Understanding among the Arizona Department of Transportation, the Federal Highway Administration, Arizona Division, and the USDA, Forest Service, Southwestern Region Regarding the Construction, Operation and Maintenance of Highways in Arizona Crossing National Forest System Lands has been added to the Roads and Facilities section in appendix D, Other Sources of Information.

Concern Statement #567: The Forest Plan should address large commercial truck use on State Route 89A. (60-3)

Response: State Route 89A is a state highway and outside of the jurisdiction of the Forest Service. Furthermore, even if the Forest managed State Route 89A, management of the vehicles used on the highway would be outside of the scope of the Forest Plan. The Forest uses the process established under the Travel Management Rule to designate the types of motor vehicles that may use routes managed by the Forest.

Concern Statement #568: The Forest Plan should change many of the discretionary guidelines in the Roads and Facilities section into required standards. The standards need to also cover the re-establishment of vegetative cover under 36 C.F.R. 219.27(a)(11). (74-77)

Response: No change has been made to the Roads and Facilities guidelines in response to this comment. Guidelines, like standards, are not optional and must be followed unless the intent of the guideline can be achieved through a different action than is prescribed by the guideline. A project or activity must be consistent with all guidelines applicable to the type of project or activity and its location in the plan area. A project or activity is consistent with a guideline in either of two ways: (1) it is designed exactly in accord with the guideline; or (2) it varies from the exact words of the guideline, but it is as effective in meeting the purpose of the guideline to contribute to the maintenance or attainment of the relevant desired conditions and objectives. Guidelines must be followed, but they may be modified for a specific project if the intent of the guideline is followed and the deviation is addressed in a decision document with supporting rationale. However, when deviation from a guideline does not meet the original intent, a plan amendment is required. See the Plan Content and the Future Projects, Program Plans, and Assessments sections in chapter 1 of the Forest Plan for additional information.

Re-establishment of vegetative ground cover is addressed in several locations in the Forest Plan. For example, see FW-RdsFac-G-6, FW-Soil-DC-3, FW-Water-G-1, FW-Rip-RipType-DC-3, FW-TerrERU-Grass-G-1, FW-TerrERU-IC-DC-4, FW-TerrERU-PJ-DC-4, 9, 10, and 14, FW-TerrERU-PP-DC-2 and 8, FW-TerrERU-MC-All-DC-1 and 2, FW-TerrERU-MC-MCFF-DC-8, FW-TerrERU-MC-MCIF-DC-4, and FW-TerrERU-SF-DC-4 and 9.

Concern Statement #569: The Forest Plan guideline regarding standard low-clearance vehicle access on Dry Creek Road should be removed. (74-103)

Response: The Forest Plan has been adjusted in response to this comment. The direction related to maintenance of Dry Creek Road has been adjusted to manage the road for safety and minimum standards

to maintain rough conditions, low traffic speeds, and the challenging, narrow character of the roadway. See MA-SedN-G-2.

Concern Statement #179: The revised Plan should not allow roads within one mile of Walnut Canyon's rim to protect ecological and archaeological resources in the area. (56-95, 61-1)

Response: While the Forest Plan does not expressly apply a 1-mile buffer around Walnut Canyon, the impacts of roads on ecological and cultural resources are addressed by forestwide plan direction. See FW-RdsFac-DC-1 and 2, FW-RdsFac-G-1, FW-Hrtg-DC-1 and 2, and desired conditions for the various ecological resources on the Forest. Rather than impose a specific buffer that may be inadequate at times to protect these resources or is unnecessarily restrictive at other times, the revised Plan requires consideration of the impacts to these resources despite their exact proximity to the rim of Walnut Canyon. A guideline in the Walnut Canyon Management Area would require activities and uses on the Forest be managed to protect cultural sites and to preserve habitat for disturbance-sensitive species both on the Forest and within Walnut Canyon National Monument. See MA-Walnut-G-1. To ensure compatible management of overlapping resources, a management approach in the Walnut Canyon Management Area encourages coordination with the Monument.

Concern Statement #701: The Forest Service should clarify the effect of roads on habitat fragmentation and avoid generalizations that roads impact connectivity. Major transportation corridors have the greatest impacts to connectivity while tertiary roads have fewer to negligible impacts by comparison. The 2013 Coconino County Wildlife Connectivity Assessment identified major transportation corridors as the primary barriers to animal movements on and adjacent to the Coconino NF. (75-143, 75-147, 75-151, 75-153)

Response: The analysis of connectivity and fragmentation in the environmental impact statement has been expanded in response to these comments. It now includes a discussion of the impacts of tertiary roads versus major transportation corridors on wildlife. Concepts from the 2013 Coconino County Wildlife Connectivity Assessment have also been added.

Scenic Resources

Concern Statement #172: In the revised plan section on All Scenic Byways, the Forest Service should include SR 89A (Sedona-Oak Creek Scenic Road and Dry Creek Scenic Road) and SR 180 (San Francisco Peaks Scenic Road). These are currently not listed. (83-10)

Response: The Scenic Roads section of the revised Plan has been adjusted to recognize the Dry Creek Scenic Road, the San Francisco Peaks Scenic Road, and the Sedona-Oak Creek Canyon Scenic Road and to clearly identify management direction associated with these roads.

Concern Statement #173: In the revised plan, the Forest Service should add some additional information in the Scenic Byways section or any other relevant sections and add some additional information in the Appendix that details Other Sources of Information. Some examples of material that could be added includes adding mileposts for the sections of roads with special designations; distinguishing between State versus Federal scenic road designation, and adding the Four Agency Partnership Handbook, the USFS-ADOT Memorandum of Understanding, and any Corridor Management Plans to Other Sources of Information. (83-12)

Response: Several changes have been made to the Scenic Roads subsection of the Special Areas section in the revised Plan in response to this comment. The General Description and Background section has been adjusted to discuss the various Federal and State scenic roads that cross the Forest. Mileposts for the State scenic roads have been added to the General Description and Background section to clarify their locations. The other documents have been referenced in the Scenic Roads section in appendix D of the

revised Plan. To ensure that desired conditions for scenic roads are taken into account when road corridors and other associated infrastructure are designed, constructed, and maintained, a Roads and Facilities desired condition was adjusted. See FW-RdsFac-DC-2.

Concern Statement #278: The Forest Plan should clarify the Scenic Integrity Objective (SIO) that will be applied to road facilities. Does an exemption from the high SIO mentioned in the Scenic Resources desired conditions (see Draft Revised Plan FW-Scenic-DC-4) mean that the moderate SIO would be applied? Does the exemption apply to buildings associated with road facilities? Furthermore, instead of applying area-wide SIOs, the Forest Service should develop desired conditions based on the different types of road facilities, such as interstates, state highways, and scenic roads. (83-8)

Response: The Forest Plan has been adjusted in response to this comment.

This Scenic Resources desired condition exempts structures associated with interstates, major state highways, and regional travelways from meeting high scenic integrity objectives in the immediate foreground. See FW-Scenic-DC-9. The term "structures" has a commonly understood definition that includes buildings associated with road facilities. The desired condition does not set a specific scenic integrity objective to be applied to exempted structures, but it has been expanded to explain that how the exemption is applied is determined at the project level based on site-specific information. This exemption does not apply to segments that are designated State scenic roads or National All-American Roads. See FW-Scenic-DC-9.

Thank you for the suggestion to develop desired conditions that would be based on different types of road facilities, such as interstates, state highways, and scenic roads. The forest pursued a different approach that should achieve similar results. Rather than develop different sets of desired conditions for different road types, the Forest considered what kind of road was in an area when setting the scenic integrity objective for that area. In this way, the scenic integrity objectives are tailored to the road type. Separate desired conditions were developed for scenic roads. See SA-ScenicRds-DC-1 through 4. The forest looks forward to working with roadway managers to refine application of the scenic integrity objectives as projects come up. This is consistent with the Scenic Resources management approach that reminds forest managers to:

> Coordinate with other entities, such as the Arizona Department of Transportation, local governments, and commercial and private entities to protect scenic integrity on and adjacent to the national forest and to identify opportunities for SIO rehabilitation.

Concern Statement #315: The Forest Plan should require the desired conditions for scenic resources that are applied to a specific project in the Sedona-Oak Creek area to be based on the landscape character description that best fits the project area, not on the landscape character description applied to one of the management areas in which the project is located. (74-104, 74-105, 74-106)

Response: The suggested modification has not been incorporated into the Forest Plan because of a reorganization of the management areas. The four management areas that encompass the Sedona-Oak Creek area have been reorganized to make them easier to use. The Oak Creek Canyon, Sedona Neighborwoods, and House Mountain-Lowlands Management Areas are no longer subsections of the Sedona-Oak Creek Management Area. These three management areas have been adjusted to be standalone management areas like the Sedona-Oak Creek Management Area. Management area direction from the Sedona-Oak Creek Management Area that applied to these other three management areas has been copied into those management areas and adjusted if necessary. To help clarify that the management area formerly called Sedona-Oak Creek no longer applied to the entire region, that management area was

renamed the Red Rock Management Area. Furthermore, the landscape character description language has been removed from the desired conditions for these management areas, as with scenery desired conditions in other management areas. The landscape character descriptions are not desired conditions in the Revised Plan; scenic integrity objectives are the desired conditions. The General Description and Background sections for these management areas identify which landscape character zone applies to each of these management areas. The complete landscape character descriptions can be found in the document titled Landscape Character Descriptions, Coconino National Forest in the project record and on the Forest website. Scenic integrity objectives are addressed in a forestwide desired condition. For examples, see FW-Scenic-DC-2. The map referenced in FW-Scenic-DC-2 includes desired scenic integrity objectives for the Red Rock, Oak Creek, House Mountain-Lowlands, and Sedona Neighborwoods management areas. The desired scenic integrity objectives for the Red Rock, Oak Creek, House Mountain-Lowlands, and Sedona Neighborwoods management areas are incorporated by reference to the scenic integrity map and FW-Scenic-DC-2. See MA-RedRock-DC-10, MA-OakCrk-DC-11, MA-HouseMtn-DC-6, and MA-SedN-DC-4.

The discussion on overlapping direction has been removed from the General Description and Background sections for all of these management areas. The General Description and Background for Scenic Resources still acknowledges that even though landscape character description zone boundaries are distinct, where a desired landscape character applies on the ground is not always distinct and may vary over time. Accordingly, on-the-ground interpretation of these desired landscape character descriptions by a forest landscape architect or other qualified individual is acceptable based on site-specific knowledge and documentation.

Concern Statement #571: The Forest Plan should include clearly defined desired conditions and review procedures to perform maintenance activities on scenic roads relative to aesthetic and other considerations. (83-9)

Response: The Forest Plan provides a strategic framework for managing scenic roads. For example, a Scenic Roads desired condition seeks to preserve and promote scenic roads in a manner that protects their intrinsic qualities and enhances visitor appreciation of their resources, consistent with each designation. See SA-ScenicRds-DC-1. The specific management actions, such as maintenance activities, that need to be taken to meet this desired condition are identified at the project level based on site-specific information.

Concern Statement #572: The Forest Plan should retain the Scenic Integrity Objectives (SIO) exemptions for highways and regional travelways and associated structures, including wildlife structures. (83-7)

Response: Although the Scenic Resources desired condition that acknowledges that highways and regional travelways and associated structures are exempted from meeting high SIOs in the immediate foreground has been edited for clarity, the exemption has been retained. See FW-Scenic-DC-9. The Scenic Resources guideline that addressed exemption of wildlife structures from SIOs has been incorporated into that desired condition. See FW-Scenic-DC-9.

Concern Statement #573: The Forest Plan should explain the implications of including Arizona Department of Transportation roadway corridors on the Scenic Integrity Objectives (SIO) rehabilitation map. (83-13)

Response: The specific details on precise rehabilitation efforts, the surrounding impacts to SIOs, the desired outcome, and who would undertake the rehabilitation will depend on the project and will be determined at the project level based on site-specific information. Identification of an area on the SIO rehabilitation map simply helps the Forest get a complete picture of where there are needs for SIO

rehabilitation. However, SIO rehabilitation is opportunity-based and may not always be the primary purpose of a project. SIO rehabilitation could be included as part of a vegetation restoration project or a road maintenance or reconstruction project.

A management approach in the Scenic Resources section has been adjusted to remind forest managers to:

> Coordinate with other entities, such as the Arizona Department of Transportation, local governments, and commercial and private entities to protect scenic integrity on and adjacent to the national forest and to identify opportunities for SIO rehabilitation.

Concern Statement #590: The Forest Plan should consider future generations and control development and impacts to scenery. (589-1, 663-1, 1574-1)

Response: The Forest Plan contributes to ecological, social, and economic sustainability focused on meeting the needs of the present generation without compromising the ability of future generations to meet their needs. The Forest Plan gives direction to manage the Forest consistent with the Multiple Use-Sustained Yield Act of 1960 and provides goods and services including outdoor recreation, timber, range, watershed, wildlife, and fish.

Forest plan direction applies to activities and uses on forest-administered lands, not privately owned lands. The Scenery Resources section has desired conditions, standards, guidelines, and objectives that are intended to maintain or improve scenic integrity objectives. This section and the General Description and Background section for each management area also point to the Landscape Character Description document (see appendix D in the plan), which has information on the different landscape character description zones on the forest.

Concern Statement #601: The Forest Plan should require the visual impacts from management activities in Concern Level 1 and 2 travel routes to be restored as soon as reasonably possible after the completion of the project. (74-91)

Response: The Forest Plan has been adjusted in response to this comment. The Scenic Resources guideline has been adjusted to require evidence of management activities in view of Concern Level 1 and 2 travel routes to be restored in a timely manner following completion of the activity to harmonize with the surrounding landscape. See FW-Scenic-G-3.

Concern Statement #190: The Forest Plan should include a Beaver Creek Management Area with specific direction for scenery in that area. (99-3)

Response: The topic of scenery has been addressed in forestwide direction in the revised Plan. See FW-Scenic-DC-1 and 2.

Although a Beaver Creek Management Area has not been identified as part of the revised Plan, in response to your comments the Verde Valley Management Area plan components were reviewed, edited, and augmented. The desired conditions for scenery in the Verde Valley Management Area have been addressed in the same manner as other management areas, which incorporate the forestwide desired condition that addresses scenic integrity objectives. See FW-Scenic-DC-2. The map referenced in FW-Scenic-DC-2 includes desired scenic integrity objectives for the Verde Valley Management Area. The desired scenic integrity objectives for the Verde Valley Management Area are incorporated by reference to the scenic integrity map and FW-Scenic-DC-2. See MA-VerdeV-DC-6.

Concern Statement #262: The Forest Plan should include more restrictions for the San Francisco Peaks to protect its unique scenic beauty and cultural significance. (56-81)

Response: Future projects and activities, of any kind, must be consistent with the Forest Plan and various laws, agency policy, and direction. See the Future Projects, Program Plans, and Assessments section in chapter 1 of the Forest Plan. The Forest Plan provides forestwide direction on forest resources (see chapter 2 of the Forest Plan). Forestwide direction on scenic beauty is located in the Scenic Resources section. See FW-Scenic-DC-1 and 6. Forestwide direction on areas with cultural significance is found in the Heritage Resources section. See FW-Hrtg-DC-1 to 5 and FW-Hrtg-G-3, 4, 6, and 7. The Forest Plan provides additional guidance for the San Francisco Peaks Management Area (see chapter 3 of the Forest Plan). The management area direction includes desired conditions for scenery and heritage resources. See MA-Peaks-DC-5 and 1. All of these plan components will regulate future activities on the Forest. Forestwide Direction for Recreation Special Uses (such as for the Snowbowl Ski Area) are found in the section on Special Uses. Administration of existing special use permits are handled at the district level.

Past decisions are outside the scope of the Forest Plan.

Concern Statement #263: The Forest Plan should not include direction on disposal of national forest parcels less than or equal to 10 acres in size in the Sedona-Oak Creek management areas or the direction should be clarified to make it clear that disposal of national forest parcels in these areas would only occur if they preserve the size and integrity of the area. (74-102)

Response: The Forest Plan has been adjusted in response to this comment. This guideline has been retained, but the intent has been clarified as suggested in the comment. The guideline now clearly states that its intent is to maximize the retention of National Forest System lands in the Sedona-Oak Creek management areas when disposal of National Forest System lands is being considered to resolve encroachment issues or provide lands needed for public purposes. See MA-RedRock-G-9, MA-OakCrk-G-14, MA-SedN-G-6, and MA-HouseMtn-G-7.

Concern Statement #279: The Forest Plan should apply a Scenic Integrity Objective of very high to the areas west of Highway 179 because this area includes Cathedral Rock and other red rock formations. (74-108)

Response: Scenic Integrity Objectives (SIO) were identified through a modeling exercise. Special areas, such as designated wilderness, recommended wilderness, and geological areas, were identified with a very high SIO. Cathedral Rock is not within one of these special areas. However, the scenic value of the features mentioned in the comment were mapped as high SIO in recognition of these features. The larger landscape that surrounds these features does not meet the definition of very high, which requires intact landscapes with only minute, if any, deviations. The development near Cathedral Rock creates a landscape that has more than minute deviations, which makes it inappropriate to apply a very high SIO to it.

Concern Statement #600: The Forest Plan should contain plan components that protect the soils and viewsheds in the Volcanic Woodlands Management Area. (56-79)

Response: The Volcanic Woodlands Management Area direction has been reviewed and expanded in response to this comment and as part of a comprehensive effort to provide consistency on the level of information and direction included in each management area. In general, management of soils and viewsheds is addressed through forestwide direction located in the Soil and Scenic Resources sections of the Forest Plan. For example, soil function and productivity is addressed in several forestwide desired conditions in the Soil section. See FW-Soil-DC-1, 2, and 3. Management approaches in the Soil section remind forest managers to:

Use published terrestrial ecosystem survey information: (1) for broad resource and forestwide assessments and land management and project planning at regional, forest, and district levels; (2) as the basis for determining project goals and objectives, desired ecological conditions, and for predicting effects and impacts of the different management prescriptions and activities upon each terrestrial ecosystem; and (3) for the initial selection of areas for proposed projects.

Conduct onsite soil investigations and refine mapping for soil-disturbing projects that require site-specific, precise, highly detailed soil information, which is beyond the scale of the terrestrial ecosystem survey. Analyze or collect site-specific terrestrial ecosystem survey information as needed to accurately determine limitations, suitability, and productivity potentials of the different terrestrial ecosystems that occur.

Scenic values and scenic integrity are also addressed in several forestwide desired conditions. For examples, see FW-Scenic-DC-1 and 2. The map referenced in FW-Scenic-DC-2 includes desired scenic integrity objectives for the Volcanic Woodlands Management Area.

In addition to the forestwide direction on scenic resources, the expanded Volcanic Woodlands Management Area includes a desired condition for large tracts of unroaded landscape in Deadman Wash. See MA-VolcanWd-DC-4. The desired scenic integrity objectives for the area are incorporated by reference to the scenic integrity map and FW-Scenic-DC-2. See MA-VolcanWd-DC-5. The General Description and Background section for the Volcanic Woodlands Management Area reminds the reader that this management area is within the Volcanic Woodlands Landscape Character Zone. The landscape character description is one of several components that is considered when determining whether forest management is meeting the assigned scenic integrity objective.

Concern Statement #606: The Forest Plan should not assign a Scenic Integrity Objective (SIO) of "very high" to utility corridor that crosses the West Clear Creek Wilderness. (43-10)

Response: The Forest Plan has been adjusted in response to this comment. The SIO map in the Forest Plan has been corrected to indicate that the SIO for the utility corridor that crosses the West Clear Creek Wilderness has an SIO of "high." See map 13 in appendix A of the Forest Plan. The map reflects that under alternative B (modified) that larger transmission lines, such as the one crossing West Clear Creek are assigned an SIO of "high."

Concern Statement #608: The Forest Service should consider whether additional plan direction would assist in limiting land exchanges and preserving the scenic resources in the Sedona-Oak Creek area. (47-4, 74-16)

Response: No change has been made in response to this comment. The forestwide and management area direction for land adjustments and scenic resources that is applicable for the Sedona-Oak Creek area has been reviewed. It provides a comprehensive framework that would guide any land adjustment proposal in this area. Much of the direction related to land adjustments has been carried forward from the current plan. Under the current plan, there have been very few land adjustments in the Sedona-Oak Creek area since 1998 when Amendment 12 was added to the plan. Under that direction, there has been one land exchange (7.50 acres acquired by the Forest and 8.43 acres disposed), two land sales (286.4 acres disposed by the Forest), and eight purchase (451.33 acres acquired by the Forest). This is a strong indicator that the direction in the Forest Plan is adequately limiting land exchanges and preserving the Forest's land base.

The direction in the Forest Plan also adequately addresses the concern related to preserving the scenic resources in the Sedona-Oak Creek area. The guidelines for Land Adjustments indicate that the Forest should consider acquiring lands that contribute to areas of high or very high scenic integrity. See FW-

LndAdj-G-1. Likewise, lands that have lost their wildland characteristics (an indication of reduced scenic integrity) are among those lands that should be considered when a land adjustment is being considered. See FW-LndAdj-G-2. These plan components will work together to ensure that scenic integrity is a factor when land adjustments are considered.

Concern Statement #658: The Forest Plan should identify a quantifiable way to measure the impact of motorized recreation on the scenery in the Volcanic Woodlands Management Area. (56-80)

Response: The Forest Plan addresses scenery through the application of the Scenery Management System. The Scenery Management System, as outlined in Agricultural Handbook 701, is today's best science to achieve high-quality scenery as an outcome of national forest ecosystem management practices. Scenery Management System inventories were completed for the Coconino NF as part of the land and resource management plan revision process. Visibility is used as one of the factors when inventories are developed under the Scenery Management System. The principles of scenery management are to be applied forestwide, including the Volcanic Woodlands Management Areas, during project-level planning. Additional information on the Scenery Management System is included in the Scenery Resources section in appendix C of the environmental impact statement.

Socioeconomic Resources

Concern Statement #160: In the revised plan and the environmental impact statement, the Forest Service should identify the magnitude of growth and impacts on the Forest to better articulate the concern for population growth. (74-17)

Response: The magnitude of population growth for recent decades is discussed in the Population Growth subsection of the Socioeconomics section in the environmental impact statement. According to the U.S. Census Bureau, population growth between 2000 and 2010 was at a slower rate than between 1990 and 2000. See the population change table in the Population Growth subsection of the Socioeconomics section in the environmental impact statement. The revised plan and the environmental impact statement were developed based on the assumption that the population associated with the project area would continue to grow, but no particular rate of growth was not identified. The accuracy of population projections, particularly fine-scale (e.g., county-level) projections, can involve a great deal of uncertainty due to factors like individuals' tastes and preferences and economic change that can substantially influence city- or county-level mobility. The assumption that the population will continue to grow is supported by information from the State Demographer's Office for Arizona, which has county-level population projections through 2050. They use low, medium, and high ranges, but in all cases they seem to use a pretty simple assumption that current growth rates will gradually decline over time (i.e., population will continue to grow, but more slowly).

The revised plan was developed with the recognition that there may be increased use of the Forest associated with anticipated population growth. The revised plan puts a heavy emphasis on the desired conditions of natural resources. Recreation and other uses that may be associated with population growth are acknowledged as appropriate uses of the Forest, but are balanced against the capacity of forest resources to support them. See FW-Rec-All-DC-6. A guideline in the Recreation section ensures that the desired conditions of other resources are considered in recreation management decisions. See FW-Rec-All-G-1. Population growth could lead to other pressures on forest resources in the form of demands for water or access. As with recreation, desired conditions guide the way for protecting important resources and guidelines ensure that those desired conditions are being maintained or moved toward. For examples, see FW-Water-DC-3, FW-ConstWat-G-1, FW-Graz-G-2, FW-FProd-G-1, FW-Rds-Fac-G-1, and FW-SpecUse-G-1. In addition, interpretation and education should be adaptive and responsive to changes in population. See FW-InterpEd-DC-4.

Concern Statement #311: The Forest Plan should protect the Forest so it can benefit the physical, emotional and economic welfare of visitors and local people and businesses. (1638-1)

Response: The Forest Plan is designed to contribute to ecological, social, and economic sustainability focused on meeting the needs of the present generation without compromising the ability of future generations to meet their needs. The plan gives direction to manage the Forest consistent with the Multiple Use-Sustained Yield Act of 1960, and to provide goods and services including outdoor recreation, timber, range, watershed, wildlife, and fish.

Concern Statement #729: The Forest Service should conduct an economic analysis that considers the contributions of recreation on the Forest. (64-25)

Response: The Forest Service conducted an extensive economic analysis as part of the Coconino NF's forest plan revision effort. In 2008, the Forest prepared an Economic and Social Sustainability Report (USDA Forest Service 2008a). This report recognized that the Forest provides the setting for a broad array of recreational activities. In 2010, the Forest prepared the Analysis of the Management Situation. This document recognized that the area economies are shifting from commodity-based to service-based industries and that recreation supports and stimulates the tourism industry. As part of the preparation of the environmental impact statement for the plan revision effort, a Socioeconomic Resource Report has been prepared (USDA Forest Service 2016f). This report provides detailed information on the economic effects of the four alternatives being analyzed in detail and the methodology used to determine those effects. The report specifically addresses the economic effects associated with recreation. Information from the Economic and Social Sustainability Report, the Analysis of the Management Situation, and the Socioeconomic Resource Report has been summarized in the Socioeconomic Analysis sections in chapter 3 and appendix C of the environmental impact statement.

Concern Statement #768: The Forest Service should not use labor income as a measure to compare alternatives in the economic analysis in the environmental impact statement. Instead, the Forest should use more simplistic methods to generate values and associated costs. For example, to determine the value of recreation on the Coconino NF, the Forest should simply multiply the number of recreational visits reported by the National Visitor Use Monitoring that is conducted every five years by the value of a forest visit established by Stynes and White (2005): $138 a day for a visit to a developed campground; $115 a day for a visit to an undeveloped campground. (64-26)

Response: The National Visitor Use Monitoring (NVUM) program provides the best available information on the number of annual visits to national forests and associated visitor expenditures. NVUM uses a statistical sampling procedure, rather than a census count, to estimate annual visitation and visitor expenditures that occur within 50 miles of the recreation site. NVUM captures all types of recreation activities, including camping, fishing, and hunting.

The economic modeling system (IMPLAN) uses information from NVUM on the number of visits and average visitor expenditures to estimate employment and labor income consequences in the analysis area. Only reporting expenditures, as the comment suggests, does not give an accurate portrait of local economic consequences. Many of these expenditures will not meaningfully contribute to local economic activity. For instance, a $50 purchase of gasoline or groceries by a recreation visitor will not contribute $50 to local economic activity, since most of the value, and associated impacts, of that purchase occur outside the local area (e.g., in distant oil extraction sites, refineries, and trucking companies). Reporting the employment and labor income attributable to recreation visitor expenditures more accurately estimates the local economic consequences of Forest Service management activities, since it considers what share of the expenditures cycle through the local area, rather than leaking out to other parts of the United States or overseas.

Concern Statement #772: The Forest Service should provide an economic analysis for recreation, grazing, and wildlife on par with what was produced for other functions. (64-58)

Response: Section 219.12(g)(3) of the 1982 Planning Rule provides direction for conducting forest plan revision efforts and outlines the requirements for the economic analysis, which include:

Direct and indirect benefits and costs, analyzed in sufficient detail to estimate --

i. the expected real-dollar costs

ii. the expected real-dollar value

iii. the economic effects of alternatives and

iv. the monetary opportunity costs (changes in present net value)

[from § 219.12(g)(3)].

The Forest has conducted the required economic analysis. The economic impact analysis for all program areas, including recreation, grazing, and wildlife, including methodology and economic models, can be found in the Socioeconomic Resource Report (USDA Forest Service 2016f) which has been included in the project record and is available on the Coconino NF's web site at: http://www.fs.usda.gov/project/?project=32780. The results of the economic analysis are summarized in the Socioeconomic Resources section in chapter 3 of the Final Environmental Impact Statement.

Soil

Concern Statement #131: The environmental impact statement should disclose current soil condition and soil condition from 1987 to allow reader to determine whether soil conditions have improved under Forest Service management. (64-19)

Response: The forest plan revision effort addresses this concern, but not in exactly the manner suggested. Rather than comparing current soil conditions with soil conditions from 1987, the forest plan revision effort considered current soil condition and trend compared to reference (or historical) soil conditions (conditions thought to be present historically before European settlement) to determine whether there is a need for change in forest management and plan language. The goal of either approach is essentially the same: to determine how soil resources are doing under management associated with the 1987 forest plan.

Consideration of soil resources is documented in several publications that were prepared as part of the forest plan revision effort. A Soil Report was prepared early in the process in 2009 to pull together detailed information on soil condition, soil productivity, and biological crusts and this was updated in 2016 (USDA Forest Service 2016g). Detailed information on soil condition and trend was summarized in the Ecological Sustainability Report (USDA Forest Service 2009a) then carried forward into the Analysis of the Management Situation (USDA Forest Service 2010a). Trends in the Analysis of the Management Situation ranged from away from reference to toward reference conditions, and this document expressed the following concern based on the conditions and trends associated with soil resources:

> One-third of the Forest’s soils is in impaired or unsatisfactory condition because of off-highway vehicle use, improperly located roads, historical livestock grazing, or exclusion of fire. These soils are susceptible to accelerated erosion and loss of soil productivity. Additionally, drought has resulted in reduced vegetation and ground cover, putting soils at greater risk. Risks associated with these conditions include increased sedimentation in lakes and rivers that degrades water quality and decreased plant and tree growth. These risks can place species that depend on these habitats at risk, as well as impact humans that depend on the water or vegetation for recreation or their livelihood.

Based on this concern, the Analysis of the Management Situation identified the following need for change:

> One of the main goals of the current Forest Plan is to improve and maintain soil condition and productivity. Plan direction for soils should be reviewed and updated where needed.
>
> The Forest Plan direction for soils has been reviewed and updated. Consistent with the Forest Plan's strategic approach, an emphasis has been placed on desired conditions.

The revised Forest Plan provides a framework that will guide decisions on projects and activities on the Forest in a manner that ensures that soil productivity and function is improved or maintained. See FW-Soil-DC-1, 2, 3, and 4. Projects and activities that are implemented and authorized under the Forest Plan will need to demonstrate consistency and compliance with the components of the Forest Plan. Designing projects and activities to be consistent with the desired conditions and guidelines in the Soil section and elsewhere in the Forest Plan, will ensure that management decisions under the plan will maintain or improve the soil conditions on the Forest.

Concern Statement #132: The Forest Service should make improvement of soil condition a priority. (64-55)

Response: The Forest Plan emphasizes improvement of soil conditions in several ways. Soil function and productivity is addressed in the desired conditions. See FW-Soil-DC-1 to 5. Guidelines in the plan direction for other resources and program areas ensure that these desired conditions are considered by those other resources and program areas. For example, a guideline in the Livestock Grazing section requires grazing to be managed to maintain or move toward desired conditions for other resources. See FW-Graz-G-2. An objective in the Soils section seeks to maintain or improve soil conditions on 100,000 to 350,000 acres during the 10 years following plan approval. See FW-Soil-O-1. Guidelines in the Soils section require projects to be designed to avoid disturbance that would cause long-term impacts to soil productivity and function. See FW-Soil-G-2 and 3. A guideline in the Watersheds and Water section promotes watersheds having enough vegetative ground cover to maintain long-term soil productivity. See FW-Water-G-1. These plan components ensure that maintenance and improvement of soil conditions are given strong consideration on all activities on the Forest.

Concern Statement #9: The Forest Service should adjust plan direction to provide more protection for biological soil crusts. (5-5, 11-2, 56-13, 74-70)

Response: The desired condition that addresses biological soil crusts has been adjusted in response to these comments. See FW-Soils-DC-4. The reference to a third of the area impacted was removed because it was confusing and not supported by scientific literature. The desired condition now contains an expression of what biological soil crusts should do, not levels of disturbance. Potential impacts to soil resources, including biological soil crusts, will be considered at the project level based on the soil resources that are present in the project area and the activities that are being considered.

Concern Statement #129: The Forest Service should deter OHV use from occurring on volcanic cinder terrain surrounding the Sunset Crater Volcano National Monument and develop a management plan for the Cinder Hills OHV Area. (86-61)

Response: Desired conditions in the Forest Plan would clearly delineate the boundary between the Cinder Hills Off-highway Vehicle (OHV) Area and Sunset Crater Volcano National Monument, and information would be provided to drivers to distinguish between the rules governing the Monument and rules governing the OHV area. See MA-VolcanWd-DC-3.

Implementation of desired conditions in the section on Interpretation and Education would result in visitors having clearly worded signs and information on authorized motorized use and restrictions. See FW-InterpEd-DC-5.

Management approaches in the Volcanic Woodlands Management Area remind managers to coordinate with the National Park Service on overlapping resources and managing motorized recreation to prevent intrusion into Sunset Crater Volcano National Monument and Strawberry Crater Wilderness Area. They are:

> Coordinate with the National Park Service to develop and ensure compatible management of overlapping resources in this management area.
>
> Manage motorized recreation in and around the Cinder Hills OHV Area to prevent intrusion on Sunset Crater Volcano National Monument and Strawberry Crater Wilderness Area.

Concern Statement #130: The Forest Plan should recognize that recent volcanic cinder soils are ecologically unique and fragile. (86-60)

Response: The Forest Plan does not specifically say that recent cinder soils are ecologically unique and fragile, but it does address cinder soils in two main areas of the plan - Soil and the Geological Feature subsection of Biophysical Features.

Desired conditions in the Soil section promote properly functioning soils and soil productivity within the capability of the site. See FW-Soil-DC-1, 2. There is also a guideline that would apply to cinder soils in some circumstances. This guideline requires project-specific design features when projects have a moderate or severe erosion hazard, on steep slopes, and on soils sensitive to degradation when disturbed. See FW-Soil-G-3.

Two management approaches remind managers to use published terrestrial ecosystem survey information and to conduct onsite soil investigations as a basis for evaluating a project and predicting impacts and suitability for different terrestrial ecosystems. They read:

> Use published terrestrial ecosystem survey information: (1) for broad resource and forestwide assessments and land management and project planning at regional, forest, and district levels; (2) as the basis for determining project goals and objectives, desired ecological conditions, and for predicting effects and impacts of the different management prescriptions and activities upon each terrestrial ecosystem; and (3) for the initial selection of areas for proposed projects.
>
> Conduct onsite soil investigations and refine mapping for soil-disturbing projects that require site-specific, precise, highly detailed soil information, which is beyond the scale of the terrestrial ecosystem survey. Analyze or collect site-specific terrestrial ecosystem survey information as needed to accurately determine limitations, suitability, and productivity potentials of the different terrestrial ecosystems that occur.

The Geological Features subsection includes the slopes of cinder cones as talus slopes for which there is specific plan direction. Desired conditions would keep these slopes generally undisturbed, so the geological, hydrological, biological, and other resource values can be maintained. See FW-BioPhys-Geo-DC-1. A guideline would require that the integrity and function of talus slopes be maintained. See FW-BioPhys-Geo-G-1. A management approach in this same subsection reminds managers to educate the public about the unique ecological and aesthetic value of geological features including resource protection.

Concern Statement #133: The Forest Service should identify the soil condition classification for the acres that have been determined to be not capable of supporting livestock grazing and assure that no non-native grazing species are allowed to graze on soil types that are classified as unstable, unsatisfactory, or impaired. (64-56)

Response: As part of the forest plan revision effort, the Forest was modeled to determine its capability to provide forage for domestic livestock grazing at the Forest level. The methodology for the capability modeling is discussed in the Livestock Grazing section of appendix C in the environmental impact statement.

Modeling efforts to identify capable grazing lands are not an attempt to define land that is capable of being grazed under all possible management intensities, prescriptions, management scenarios, etc. Nor, is it an attempt to define areas that should never be exposed to the presence of livestock. Capability modeling provides a reasonable, conservative assurance that the areas of land depicted as capable are capable of being grazed. Capability modeling does not define nor depict decisions that lands not displayed as capable are incapable of being grazed or should not be managed for livestock grazing. The models were used to estimate the amount of national forest rangelands that would provide a forage base for supporting livestock grazing under typical management scenarios and conservative grazing management practices. Not identifying an area as capable for livestock grazing within a grazing allotment does not mean that incidental livestock use will not occur in that area. For example, areas where the existing tree canopy reduces forage production to less than 100 pounds per acre would be identified as not capable. However, this classification does not mean livestock could not or should not pass through the area or graze some of the forage in the area. It just means the area was not deemed to have enough forage production to be used as a base for determining grazing capacity for the allotment. The same logic applies to lands that have soil types that limit forage production, such as the soils classified as “inherently unstable” in the Terrestrial Ecosystem Survey data used for the capability modeling in the forest plan revision effort.

For these reasons, the soil condition classification of lands modeled as not capable is unrelated to the determination that the lands are not capable of supporting livestock grazing. Soil condition is a factor that is considered at the project level, where decisions on whether to authorize grazing in a particular area and how to manage that grazing are made.

Concern Statement #136: The Plan should include components that address vegetative litter and soil erosion rates to ensure that soils are adequately protected. (64-38, 64-39)

Response: Litter, bare soil, and erosion rates are not specifically quantified because they naturally vary depending on landscape and site potential. Desired conditions in the soil section focus on soil function and overall productivity including the ability of the soil to resist erosion, reduced occurrences of compaction, and reduced instances of overland flow. See FW-Soil-DC-1, 2, and 3. Desired conditions recognize that localized accelerated soil erosion would naturally occur following high-severity fires, but not to the extent of long-term impairment. See FW-Soil-DC-5. Forestwide soil guidelines provide limits to projects that would cause long-term impacts to soil function and productivity including loss of vegetative ground cover (including litter) and erosion. See FW-Soil-G-2. Soil guidelines would also minimize or avoid soil impacts on steep slopes, on soils with moderate or severe erosion hazard, or on soils that are sensitive to degradation when disturbed. See FW-Soil-G-3.

In addition, there are three soil management approaches that indirectly relate to litter, bare soil, and erosion rates. These management approaches remind forest managers to:

> Use published terrestrial ecosystem survey information: (1) for broad resource and forestwide assessments and land management and project planning at regional, forest, and district levels; (2) as

the basis for determining project goals and objectives, desired ecological conditions, and for predicting effects and impacts of the different management prescriptions and activities upon each terrestrial ecosystem; and (3) for the initial selection of areas for proposed projects.

Conduct onsite soil investigations and refine mapping for soil disturbing projects that require site-specific, precise, highly detailed soil information, which is beyond the scale of the terrestrial ecosystem survey. Analyze or collect site-specific terrestrial ecosystem survey information as needed to accurately determine limitations, suitabilities, and productivity potentials of the different terrestrial ecosystems that occur.

Suitability

Concern Statement #646: The Forest Plan should conduct a timber suitability determination in compliance with the National Forest Management Act. (84-2)

Response: Timber suitability classification was conducted in compliance with the provisions of the 1982 Planning Rule and Southwestern Region planning direction (Forest Service 2009). The 1982 Planning Rule includes the regulations developed to implement the National Forest Management Act. The Coconino NF suitability determination is based on land availability, capability, operability, management area objectives and requirements, and the economic feasibility of the land. See the Timber Suitability Calculation section in appendix G of the environmental impact statement and the Timber Suitability section in the Vegetation and Fire Specialist Report (Forest Service 2016a). Also see the Timber Suitability section in chapter 4 of the Forest Plan.

Concern Statement #142: The Forest Plan should manage lands classified as suitable for timber production for natural recovery, not economic production, if they have been subjected to severe fire effects. (56-62, 84-4)

Response: Adjustments have been made to the Forest Plan in response to this comment. A management approach has been added in the section for All Ecosystems that states:

> Following large or uncharacteristic disturbance events, focus management actions on human health and safety, long-term restoration, soil and watershed stabilization, restoration or protection of ecosystem processes and resource values.

In addition, monitoring question 25 in the Monitoring Plan in Chapter 5 of the Plan relates to this topic:

> Have areas classified as unsuited for timber production become suitable?

Monitoring question 30 also relates to this topic:

> Have there been changes that have resulted in unforeseen issues requiring plan amendments?

These questions capture the reverse situation in which lands classified as suited for timber production become unsuitable.

Concern Statement #222: In addition to determining suitability for timber production on portions of the national forest, the Forest Service also must review its prior classification of lands as unsuitable for timber production. See 16 U.S.C. § 1604(k); 36 C.F.R. § 219.14(b) (1982). It is not sufficient under NFMA to list the lands that previously were deemed unsuitable and carry forward that designation into a revised forest plan.

Further analysis and comparison of alternatives is required. To inform analysis of timber suitability, we ask the Forest Service to consider and analyze the following criteria for designating lands as unsuitable for timber production:

- **High or severe soil erosion hazard identified by Terrestrial Ecosystem Survey.**
- **Slopes steeper than 20 percent.**
- **Lands within one site-potential tree height of perennial or intermittent streams or wetlands (e.g., generally 100 to 150 feet on either side of a stream bank in conifer forest vegetation types).**
- **Contiguous areas larger than 1,000 acres without roads in all vegetation types.**
- **Occupied and/or critical habitat of threatened or endangered species or candidate species proposed for listing.**
- **Designated conservation areas for sensitive or management indicator species.**
- **Occupied locations of endemic species with ranges limited to the national forest.**
- **Lands impacted by high-severity fire effects to vegetation or soil.**

(56-61, 84-3)

Response: The Forest conducted an evaluation of lands suitable and unsuitable for timber production as part of the forest plan revision effort. The methodology for this evaluation and the suitability determinations are included in the Timber Suitability Calculation section in appendix G of the environmental impact statement. The suitability and unsuitability evaluations were conducted for all alternatives considered in detail in the environmental impact statement. Through this process, the following acres were identified as unsuitable for timber production: alternative A = 1,376,864 acres; alternative B (modified) = 1,320,790 acres; alternative C = 1,378,123 acres; alternative D = 1,320,435 acres.

The Forest Products section in chapter 3 and the Timber Suitability Calculation section in appendix G of the environmental impact statement, as well as the Timber Suitability section in the Vegetation and Fire Specialist Report (Forest Service 2016a) demonstrate how the Coconino NF identified and described each ERU based primarily on the Terrestrial Ecosystem Survey, which includes information on soils and erosion hazard. As described in the Timber Suitability section of the Vegetation and Fire Specialist Report, those lands that would suffer "Irreversible Resource Damage," including those with high erosion risk (particularly on steeper slopes), were excluded from the lands suitable for timber production. Similarly, lands where harvesting on steep slopes would cause irreversible resource damage, were also excluded from the lands suitable for timber production. Many lands that are steep, but could still be harvested using current techniques, were nevertheless excluded because they are not cost efficient; for the same reason, lands that lack roads or are too isolated were also excluded.

Areas identified as water or as having riparian soils are not designated as lands suitable for timber production. The Forest Plan also provides guidance for all management activities, including timber harvest, which limits damage to all riparian areas (FW-Rip-All-G-1, 2, 3, and Management Approaches; FW-Rip-Strm-G-1, 2, and Management Approaches). These guidelines and management approaches provide for aquatic management zones designed to minimize detrimental changes to streams and riparian areas within each project.

Excluding areas from lands suitable for timber production that would be associated with candidate species proposed for listing would be too speculative and premature at the time of this analysis. However, areas of

critical habitat for endangered and threatened species, such as the Mexican spotted owl, are excluded from lands suitable for timber production under the category of lands with management prescriptions that preclude timber production.

There are not specially designated "conservation areas" for sensitive or management indicator species unless the species is also designated as endangered or threatened, in which case, the lands would be excluded based on management prescriptions limitations. During the analysis process for each project conducted under this Forest Plan, the Forest evaluates the effects of proposed actions on sensitive species and endemic species with ranges limited to the Coconino NF. Actions that may negatively affect the habitat of these species are evaluated and mitigated, as appropriate. The Forest Plan also provides a number of guidelines and management approaches that are specifically geared toward protecting and enhancing the habitat for threatened, endangered, and sensitive species and endemic species within limited ranges. Additional details regarding viability are included in other responses.

Areas impacted by high-severity fire may be excluded from the lands suitable for timber production if monitoring has determined that the long-term losses in soil productivity are such that the areas is incapable of producing industrial wood. Small changes or short-term changes in soil productivity, much less changes that are strictly limited to surface vegetation, do not in and of themselves make the land unsuitable for timber production. Areas that are incapable of producing industrial wood are identified during Forest Plan revision as part of the timber suitability determination process.

The purpose of identifying lands that are suitable for timber production is solely to calculate the long-term sustained yield and allowable sale quantity of the Forest. Those lands identified as suitable for timber production are capable of being managed for growing, tending, harvesting, and regenerating crops of trees on a regulated basis. In general, excluding lands from timber production does not provide any protections or prevent any particular land management activity. Lands categorized as unsuitable may still be managed through timber harvests, which is one of a suite of vegetation management tools. The concerns expressed in the comment are actually addressed through the relevant guidelines and management approaches described in the Forest Plan.

Concern Statement #515: The Forest Plan should defer all old-growth forest that meet standards and guidelines set forth in the 1987 plan from designation as suitable for timber harvest. (84-77, 1278-3)

Response: Timber suitability classification was conducted in compliance with the provisions of the 1982 Planning Rule and Southwestern Region planning direction (Forest Service 2009b). It is based on land availability, capability, operability, management area objectives and requirements, and the economic feasibility of the land. See the Forest Products section in chapter 3 and the Timber Suitability Calculation section in appendix G of the environmental impact statement, as well as the Timber Suitability section in the Vegetation and Fire Specialist Report (Forest Service 2016a). Also see the Timber Suitability section in chapter 4 of the Forest Plan.

For any one location, the timber suitability classification is made irrespective of the current forest structure. For example, areas that are currently unforested can still qualify as suitable for timber production, provided that the underlying land meets the requirements for availability, growing capability, operability, and economic feasibility. However, if during the forest plan revision process, specific proposed management direction is incompatible with timber production, then those affected areas will be excluded from the suitable timber base. This is the case for areas designated as developing or existing old growth under alternatives A and C.

Under alternatives A and C, the standards and guidelines for old growth set forth in the current 1987 forest plan, as amended in 1996, would be carried forward into the new plan. In ponderosa pine and

mixed conifer forests, the emphasis under the 1987 forest plan is placed on creating and maintaining large stands (100 to 300 acres) or large aggregations of contiguous stands that all have the full suite of old-growth characteristics (1987 Plan, pages 70-2; 129; 138). The effects of this proposed revised plan direction is fully considered in the Vegetation and Fire Specialist Report (Forest Service 2016a). Generally, within the ponderosa pine and mixed conifer forests, the 1987 plan direction would encourage a forest structure that does not match the historic condition or the desired conditions. Larger areas with a closed canopy and a more even-age structure would occur across the landscape; yet this structure is not supported by the best available science that is specific to southwestern frequent fire forests (Reynolds et al. 2013).

Alternatives B and D provide direction with regard to old growth that is based on the best available science. Under these alternatives, old-growth components (e.g., old trees, snags, large logs) within frequent fire ERUs should be scattered throughout the landscape, including old tree groups and single old trees intermixed with other age classes. Occasionally, old-growth components may also occur in small even-aged patches of trees.

The Forest Plan provides direction to manage for well-distributed occurrences of old growth. For example, several plan components in the All Terrestrial ERUs section (FW-TerrERU-All-DC-1, 2, and 4) express desires for:

> Each ERU contains a mosaic of vegetation conditions, densities, and structures. This mosaic occurs at a variety of scales across landscapes and watersheds and reflects the natural disturbance regimes affecting the area.
>
> Within their type and capability, terrestrial ERUs are functioning properly and are resilient to the frequency, extent, intensity, and severity of disturbances, such as fire in fire-adapted systems, and adapt to climate variability. Natural and human disturbances provide desired overall plant density, species composition (i.e., mix of species), structure, coarse woody debris, and nutrient cycling. Desired disturbance regimes, including fire, are restored where practical.
>
> Vegetation conditions allow for inclusions and variability within the landscape as well as for transition zones or ecotones between riparian areas, forests, woodlands, shrublands, and grasslands. Transition zones shift in time and space due to factors affecting site conditions (e.g., fire, climate). Stringers persist where they naturally occur. For example, pine stringers are noncontiguous narrow communities of pine (often large old trees) that extend into lower elevation vegetation.

Most importantly though, there are specific desired conditions at the landscape scale, mid-scale, and fine scale that provide for old-growth forest structures in the relevant ERUs. See FW-TerrERU-PP-DC-6, 9, and 13 and FW-TerrERU-MC-MCFF-DC-2, 7, and 10. The Forest Plan also contains guidelines specifically designed to protect, perpetuate, restore, and promote old-growth characteristics in these ERUs. See FW-TerrERU-PP-G-1, 2, 3, and 4, FW-TerrERU-MC-All-G-2 and 3.

Tribal Relations and Uses

Concern Statement #471: The Forest Service should take steps to protect the cultural and historical foundations of tribes and other people who rely on the Coconino NF for water, food, shelter, guidance, and inspiration. (53-8, 76-2, 88-1)

Response: The Coconino NF acknowledges the importance of cooperating with tribes and incorporating their perspectives, concerns, and traditional knowledge into management decisions. See the Tribal Relations and Uses section of the Forest Plan for management direction on this subject. For example, it is a desired condition to recognize American Indian needs and viewpoints and foster a robust relationship

with federally recognized American Indian tribes and related groups. It is also a desired condition to notify tribes about proposed activities on the forest that may be of interest, encourage face-to-face dialogue about proposed activities that are of interest, and provide information about how tribal input received during consultations is used in decision-making processes. See FW-Trbl-DC-1.

Concern Statement #282: The Forest Service should comply with Native American Graves Protection and Repatriation Act (NAGPRA) if there are inadvertent discoveries of habitation sites, plant gathering areas, human remains, and objects of cultural patrimony. (88-2)

Response: The Forest Plan is, by design, strategic in nature. It does not include project-level decisions that could result in the inadvertent discovery of habitation sites, plant gathering areas, human remains, or objects of cultural patrimony. Those decisions are made later, only after specific proposals are identified and analyzed and there is the opportunity for tribal and public involvement. Human remains are addressed through NAGPRA by the Forest Archaeologist. This is separate from the Forest Plan, as the Forest Plan does not repeat law, regulation, or policy. However, as a reminder to forest managers, NAGPRA and other laws, regulations, and policies that apply to Heritage Resources, Tribal Relations, and Uses are listed in appendix D, Other Sources of Information.

Concern Statement #276: The Forest Plan should include direction on tribal consultation and how to address disagreements with tribes. (50-2, 56-65, 56-69, 56-73, 56-74, 76-1)

Response: The Coconino NF follows law, policy, guidance, and directives on communication and notification to tribes. These include the following, which have been added to appendix D in the Forest Plan - Other Sources of Information: American Indian Religious Freedom Act (16 U.S.C. 1996), Archeological Resources Protection Act of 1979 (16. U.S.C. 470 aa-mm), National Historic Preservation Act (16 U.S.C. 470 et seq.) and regulations implementing Section 106 (36 CFR Part 800), Native American Graves Protection and Repatriation Act (25 U.S.C. 3001, et. seq. and 43 CFR 10), National Environmental Policy Act Implementing Regulations (40 CFR Part 1501.2(d)(2)), Executive Order 13175: Consultation and Coordination with Indian Tribal Governments (Nov. 6, 2000), Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994), Forest Service Manual 1560 and Forest Service Handbook 1509.13.

Consultation with tribes and the importance of incorporating their perspectives, concerns, and traditional knowledge into management decisions is discussed in Tribal Relations and Uses section of the Forest Plan. For example, the Forest Plan acknowledges the special and unique government-to-government relationship (i.e., one sovereign nation to another) based on the U.S. Constitution, treaties, and statutes. See General Description and Background for the Tribal Relations and Uses section. Rather than attempt to create one particular process to resolve disagreements with all tribes through a plan component, the Forest Plan includes a management approach in the Tribal Relations and Uses section that suggests developing MOUs with tribes. It reminds forest managers to:

> Develop memorandums of understanding (MOUs) between the Forest and those consulting American Indian tribes with which an MOU does not currently exist to guide consultation processes and reflect the tribes' particular perspectives and interests.

Through the development of individual MOUs, the Coconino NF will be in a better position to ensure that consultation efforts are tailored to meet each tribe's expectations. The Forest is currently working with the Pueblo of Zuni and the San Carlos Apache Tribe to develop consultation MOUs for this purpose and is working with the Hope Tribe to update the existing consultation MOU.

Concern Statement #156: The Forest Plan should include management direction addressing the training of employees about interactions with tribal members engaging in traditional land uses. (56-66)

Response: A management approach has been added to the Tribal Relations section of the Forest Plan specific to this comment. It reminds forest managers to:

> Provide training to forest employees about interactions with tribal members engaging in traditional land uses, in a manner that fosters mutual trust and respect.

Several management approaches in Tribal Relations section of the Forest Plan emphasize coordination and consultation with tribes in addition to other Tribal-related training for Forest Service employees. The management approaches state:

> The Coconino NF and area tribes have a mutual interest in maintaining healthy, sustainable populations of plants, and other resources important for traditional and cultural purposes. Work with area tribes to identify, collaboratively manage, and monitor these resources, as well as build and maintain more detailed information about culturally important plants. Continue to manage the land in a spirit of shared stewardship with the tribes.
>
> Recognize the importance of a strong relationship with American Indian tribes and groups, and ensure Coconino NF personnel continuously cultivate those relationships. Meet regularly with consulting tribes to better understand their needs and viewpoints and consult with them in the management and interpretation of cultural sites. Enhance tribal relationships and communications through volunteer opportunities with tribal members. In addition, consider formally designating one person as a tribal relations coordinator to facilitate the tribal consultation process and maintain a record of tribal consultations.
>
> Develop memorandums of understanding (MOUs) between the Forest and those consulting American Indian tribes with which an MOU does not currently exist to guide consultation processes and reflect the tribes' particular perspectives and interests.
>
> Work with neighboring forests and local tribes to develop a consistent forest products collection policy and tribal firewood program for use on the respective national forests.
>
> Provide training to forest employees about the trust responsibilities Federal agencies have for tribes and the specific ways in which the Coconino NF honors and implements those responsibilities.

The Tribal Relations section also contains plan components that recognize the importance of certain resources to tribal members and their access to those resources. See FW-Trbl-DC-2 and 3 and FW-Trbl-G-1 and 2.

In addition to the guidance in the Tribal Relations section, the Forest Plan has language in other sections that recognize and emphasize the needs of tribal members. For example, emphasizing the availability of products for traditional and ceremonial tribal uses is a desired condition for Forest Products. See FW-ForProd-DC-3. The Forest Products section also emphasizes recognizing the needs of members of tribes in several management approaches, which remind forest managers to:

> Recognize the needs of members of tribes whose historic ties include the land now administered by the Coconino NF to collect forest materials for traditional, ceremonial, and subsistence purposes.
>
> Work with tribal members to facilitate collection of forest products needed for traditional activities and ceremonial uses.

A desired condition for Heritage Resources would preserve and protect historic and prehistoric sites, including American Indian sacred places and traditional cultural properties. See FW-Hrtg-DC-1. A guideline in Heritage Resources recommends management of historic and prehistoric sites to prevent or minimize adverse impacts through tribal consultation. See FW-Hrtg-G-6. Several management approaches for Heritage Resources encourage partnerships and coordination with American Indians and tribes. These management approaches remind forest managers to:

> Maximize opportunities for partnerships and volunteerism in all heritage program elements. Cooperate with local, State, and private agencies, institutions, and local tribes in accomplishing program goals and objectives.
>
> Work with partners such as the American Indian tribes, Arizona Site Stewards program, Arizona Archaeological Society, National Park Service, and Museum of Northern Arizona to identify, study, protect, and monitor sites and artifact collections.
>
> Prioritize site stabilization and restoration work based on the relative importance, information potential, tribal concerns, and uniqueness of a site. Conduct and document monitoring after sites have been stabilized. Plan and perform maintenance before it becomes critical to the condition of a site.
>
> Minimize the need for onsite staffing by emphasizing "self-discovery" developments. Develop interpretative messages on individual responsibility to protect forest resources, with specific messages targeted to children. Consider tribal interests when planning interpretive projects.
>
> Cooperate with private industry, museums, secondary schools, universities, organizations, and other Federal, State, and local governmental agencies to provide for heritage tourism that enhances the overall experience of visitors to the Forest, results in preservation and protection of heritage resources and their setting, and is consistent with tribal interests and desires.
>
> Encourage partnerships with American Indians, commercial ventures, volunteers, museums, and universities for documenting, preserving, interpreting, and managing sites, and to evaluate and develop creative management opportunities.

Concern Statement #313: The Forest Plan should include direction and suggestion on how to outreach to tribes. For example, the Forest Plan should include a management approach for outreach to tribes that includes: holding meetings on reservations to reach those for whom travel is difficult; providing native translators; recording oral statements for those who can't write or don't speak English; proactive advertising for tribal participation opportunities through radio/newspaper ads and public service announcements; hanging flyers about projects. (56-67)

Response: Specific suggestions for outreach methods have not been listed in the Forest Plan. Outreach to tribes is project-specific and could include all of the suggestions in the comment. The management approaches for Tribal Relations have a more strategic approach to tribal relations and include working with area tribes as follows:

> The Coconino NF and area tribes have a mutual interest in maintaining healthy, sustainable populations of plants and other resources important for traditional and cultural purposes. Work with area tribes to identify, collaboratively manage, and monitor these resources, as well as build and maintain more detailed information about culturally important plants. Continue to manage the land in a spirit of shared stewardship with the tribes.
>
> Recognize the importance of a strong relationship with American Indian tribes and groups, and ensure Coconino NF personnel continuously cultivate those relationships. Meet regularly with consulting tribes to better understand their needs and viewpoints, and consult with them in the management and

> interpretation of cultural sites. Enhance tribal relationships and communication through volunteer opportunities with tribal members. In addition, consider formally designating one person as a tribal relations coordinator to facilitate the tribal consultation process and maintain a record of tribal consultations.

Outreach to tribes follows law, policy, guidance, and directives on communication and notification to tribes. These regulations include the following, which have been added to appendix D in the Forest Plan - Other Sources of Information: American Indian Religious Freedom Act (16 U.S.C. 1996), Archeological Resources Protection Act of 1979 (16. U.S.C. 470 aa-mm), National Historic Preservation Act (16 U.S.C. 470 et seq.) and regulations implementing Section 106 (36 CFR Part 800), Native American Graves Protection and Repatriation Act (25 U.S.C. 3001, et. seq. and 43 CFR 10), National Environmental Policy Act Implementing Regulations (40 CFR Part 1501.2(d)(2)), Executive Order 13175: Consultation and Coordination with Indian Tribal Governments (Nov. 6, 2000), Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994), Forest Service Manual 1560 and Forest Service Handbook 1509.13.

Concern Statement #682: The Forest Service should establish open forums with tribal members to discuss the forest plan revision effort, not just consult with tribal governments. (56-63, 103-2)

Response: The Coconino NF made efforts to reach out to the tribes and tribal members during the 90-day comment period on the Draft Environmental Impact Statement and Draft Revised Plan. All 13 American Indian tribes that the Coconino NF regularly consults with were contacted at the beginning of the comment period. The Forest offered to meet to discuss these documents. These offers led to meetings with the Hopi and White Mountain Apache tribes. In response to suggestions that the Forest should expand its efforts to reach tribal members, the Forest contacted the Navajo Chapter Houses and offered to meet and discuss the Draft Environmental Impact Statement and Draft Revised Plan. The Forest did not receive any response to these requests.

Concern Statement #331: The Forest Plan should include guidance for how it will address issues with tribal input and constantly changing personnel. (56-72)

Response: The Forest Plan has a new management approach in Tribal Relations specific to this comment. It reads:

> Recognize the importance of a strong relationship with American Indian tribes and groups, and ensure Coconino NF personnel continuously cultivate those relationships. Meet regularly with consulting tribes to better understand their needs and viewpoints, and consult with them in the management and interpretation of cultural sites. Enhance tribal relationships and communication through volunteer opportunities with tribal members. In addition, consider formally designating one person as a tribal relations coordinator to facilitate the tribal consultation process and maintain a record of tribal consultations.

In addition, the Forest Plan has language in different sections that recognizes and emphasizes the needs of tribal members. For example, Desired Conditions for Forest Products emphasizes the availability of products for traditional and ceremonial tribal uses. See FW-FProd-DC-3. Management approaches for Forest Products emphasize recognizing the needs of members of tribes "to collect forest materials for traditional, ceremonial, and subsistence purposes" and to "[W]ork with tribal members to facilitate collection of forest products needed for traditional activities and ceremonial uses." Desired conditions for Heritage Resources would preserve and protect historic and prehistoric sites, including American Indian sacred places and traditional cultural properties. See FW-Hrtg-DC-1. A guideline in Heritage Resources recommends management of historic and prehistoric sites to prevent or minimize adverse impacts through tribal consultation. See FW-Hrtg-G-6. Several management approaches for Heritage Resources encourage

partnerships and coordination with American Indians and tribes. Several management approaches in Tribal Relations emphasize coordination and consultation with tribes in addition to other tribal-related training for Forest Service employees.

Concern Statement #63: The Forest Plan should include more information related to tribal use of plants. In addition to the information on the plants known to be traditionally used by tribes, the Forest Plan should include information on how tribes use these riparian areas and terrestrial ERUs and how these plants are managed. (86-7)

Response: To centralize the information, now there are only two places in the Forest Plan that display the percentage of plants known to be used by tribes relative to the proportion of the riparian forest type or ERU on the forest. See General Description and Background sub-sections for Riparian Forest Types and Terrestrial ERUs. The Forest Plan does not describe how the plant collecting areas are used because that could vary by tribe; because this information may or may not be shared with the Forest Service; and because plant collection areas can shift in time and space depending on growing conditions.

Plan components in the Tribal Relations and Uses and Forest Products section describe how the plants and plant collecting would be managed. For example, forest products for traditional and ceremonial tribal uses are available under conditions that minimize restrictions and are consistent with laws, regulations, and agreements with tribes; forest products should be authorized only when information is available to ensure the product will persist on the forest; and rare plant species should not be collected unless the Forest has information that the species can withstand collection and will persist. See FW-FProd-DC-3, FW-FProd-G-3, 4. Forest projects and activities should be designed to promote the persistence of culturally important plants and tribal practitioners have access to areas to practice traditional activities, with reasonable limitations, consistent with public safety and multiple uses by other forest users. Forest products used by tribes are available for traditional practices and are sustained over time; however, this collection would not negatively affect the presence and distribution of those species on the forest. See FW-Trbl-DC-2, 3, FW-Trbl-G-2. A desired condition in the Pinyon Juniper section promotes a robust crop of pinyon nuts, a culturally important resource, consistent with the capability of the site. See FW-TerrERU-PJ-DC-16. The Forest Plan assumes that properly functioning ecosystems would provide for the species composition needed for tribal plant collection, thus, the desired conditions for these plants are inherent within the desired conditions in the Riparian Areas and Terrestrial Ecological Response Units sections, but each plant is not specifically called out. Site-specific information for plant collection and tribal needs would arise out of conversations with the tribes and through tribal consultation. See FW-Trbl-DC-1.

Concern Statement #399: The Forest Plan desired condition related to plants known to be traditionally used by tribes (see Draft Revised Plan FW-Veg-All-DC-9) should be reworded to emphasize that the use is by local tribes. (86-24)

Response: Several changes have been made to the Forest Plan in response to this comment. This direction has been moved from the All Vegetation section to two other sections that are more aligned with the topic. A desired condition in the Tribal Relations and Uses section addresses this topic. It seeks to ensure that forest products used by tribal members, organizations, and communities with ancestral or historic ties to the Coconino NF are available for traditional practices and are sustained over time. See FW-Trbl-DC-3. A desired condition in the Forest Products section also addresses this topic. It seeks to ensure that forest products are available for traditional and ceremonial tribal uses. See FW-FProd-DC-3.

Concern Statement #595: The Forest Plan should complete the Traditional Cultural Properties designation process for the San Francisco Peaks. (53-7)

Response: The Traditional Cultural Properties process is outside the scope of forest plan revision. However, the San Francisco Peaks have been designated as a Traditional Cultural Property. The Forest Plan acknowledges this designation in the General Description and Background for the San Francisco Peaks Management Area.

Concern Statement #456: The Forest Plan should ensure that overnight camping restrictions address traditional cultural uses. (56-68)

Response: No change has been made in response to this comment. The Forest Plan includes a desired condition for tribal practitioners to have access to areas that provide them an opportunity to practice traditional activities. See FW-Trbl-DC-2. In addition, a desired condition in Forest Products promotes the availability of forest products for traditional and ceremonial uses with minimal restrictions and consistency with law, regulations, and agreements with tribes. See FW-FProd-DC-3. These plan components would be taken into account in projects that propose to manage or limit overnight camping.

Concern Statement #769: The Forest Service should review the Listening Session notes regarding sacred sites policy development from the March 14, 2011 meeting with the Navajo Nation in Window Rock, Arizona. (53-5)

Response: The Listening Session notes from the March 14, 2011 meeting with the Navajo Nation in Window Rock, Arizona, have been reviewed and added to the project record. The development of the sacred sites policy and the decision on development at the Arizona Snowbowl are outside the scope of the Forest Plan.

Vegetation

Concern Statement #391: The Forest Plan should use desired conditions that account for more than narrowly-defined historical conditions and include the potential effects of climate change. (56-35)

Response: Regional guidance on climate change was used during plan development. A citation to this guidance, entitled Southwest Region Climate Change Trends and Forest Planning, is listed in appendix F of the Forest Plan, which is an index of other supporting plan documentation. As stated in chapter 1 of the Forest Plan, the nature of the Forest Plan is to maintain or manage toward desired conditions, regardless of current or changing conditions (e.g., climate change). Furthermore, the Forest Plan is intended to allow management of the Forest to adapt as necessary to continue moving toward ecological and social desired conditions. Rather than being confined to one section, climate change is addressed in numerous locations in the Forest Plan. For example, adaptability and resiliency to climate change is mentioned in desired conditions in FW-Eco-DC-1, FW-Soil-DC-2, FW-Water-DC-3, FW-TerrERU-All-DC-2, 4, FW-TerrERU-PP-DC-2, FW-TerrERU-MC-MCFF-DC-4, FW-TerrERU-MC-MCIF-DC-4, FW-TerrERU-SF-DC-4, and FW-WFP-DC-6.

Reference conditions (based on the historic range of variation) and climate change were considered when determining the desired conditions. Reference conditions are considered a “best” estimate of a resilient and functioning ecosystem because they reflect the evolutionary and historical ecology of forests. Reference conditions are, thereby, a powerful template for improving the resiliency of fire-adapted forests. By restoring resiliency, current fire-adapted forests will be better able to adapt to climate change. Climate change is addressed throughout the plan: indirectly through desired conditions in the form of functional ecosystems and resilient landscapes, and directly in management approaches and the monitoring strategy, where appropriate.

In addition, adaptability is key, both in terms of the forest's capacity to adapt to changing conditions, and the Forest Service's ability to adaptively manage. Implementation of the Forest Plan is intended to

contribute to forest resources and terrestrial and riparian ecosystems' ability to adapt to climate change. See FW-Eco-DC-1; FW-Soil-DC-2; and FW-TerrERU-All-DC-2.

A management approach in all Terrestrial ERUs reminds managers to consider approaches to mitigate water stress and to facilitate the potential shift of vegetation from lower to higher life zones. It reads:

> In areas of high vulnerability to climate change, consider the following approaches to facilitate natural adaptation to changing conditions. Because many early-mid species or species characteristic of lower life zones are adapted for warmer and drier conditions, emphasize early-mid seral species or species from lower life zones over late-seral species and species of higher life zones. Consider managing tree basal area at the low end of the range of desired conditions to mitigate water stress.

The monitoring and evaluation report is intended to inform adaptive management of the plan area especially in light of changing social or environmental conditions.

Finally, as defined in the Glossary for the Forest Plan, adaptive management is the:

> General framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 CFR 219.5). This framework supports decision making that meets management objectives, while simultaneously accruing information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decision making in the face of uncertainty and changing conditions with feedback from monitoring, which includes using the planning process to actively test assumptions, track relevant conditions over time, and measure management effectiveness.

Concern Statement #404: The Forest Plan should describe how the compositions of seral stages were determined for the tables that listed the "Desired Percent Composition" for various ERUs. (86-33, 86-38, 86-39)

Response: The tables that list the "Desired Percent Composition" for various ERUs have been moved to appendix E in the Forest Plan. See tables 16, 17, 19, 20, and 21 in appendix E. Appendix E includes an introduction that provides a general description of how the seral stages included in the tables were determined.

Concern Statement #408: The Forest Plan should frame desired conditions and restoration objectives around a "future range of variability" that accounts for inevitable change to disturbance regime (e.g., fire) and vegetation pattern associated with climate change and promotes ecological resilience. (56-33, 84-88)

Response: Reference conditions (based on the historic range of variation) and climate change were considered when determining the desired conditions. Reference conditions are considered a "best" estimate of a resilient and functioning ecosystem because they reflect the evolutionary and historical ecology of forests. Reference conditions are, thereby, a powerful template for improving the resiliency of fire-adapted forests. By restoring resiliency, current fire-adapted forests will be better able to adapt to climate change. Climate change is addressed throughout the plan: indirectly through desired conditions in the form of functional ecosystems and resilient landscapes, and directly in management approaches and the monitoring strategy, where appropriate.

Concern Statement #499: The Forest Plan should include more restoration objectives in the vegetation sections. (65-7)

Response: No change has been made to the Forest Plan in response to this comment. The objectives included in the Forest Plan were developed to be realistic and to be implementable within anticipated

future budgets (expected to be similar to current budgets). The Plan Content section in chapter 1 of the Forest Plan acknowledges that objectives to achieve desired conditions are strongly influenced by recent trends, past experience, and anticipated staffing levels and short-term budgets. Forest restoration activities are not limited to those listed in the objectives, so other restoration actions can be undertaken as opportunities arise.

Concern Statement #501: The Forest Plan should use locally specific reference conditions to guide restoration activities. (84-70)

Response: The Forest Plan includes desired conditions that account for locally specific conditions. To clarify this point, the tables that include desired proportions of seral stages were moved to appendix E because including this information in chapter 2 of the Forest Plan was causing confusion over how the information in the tables should be used. The seral stage proportions for modeled states included in these tables is for assessment at the scale of the entire ERU within a Forest boundary or greater. Seral stage proportions are rarely, if ever, applied at the project level. For instance, the application of seral stage values for spruce-fir forests that typically have long stand replacement intervals and large patch dynamics, may only be appropriate at subregional scales. To emphasize that the seral stage values in these tables were not intended (in most cases) to be applied at the project level, this information was moved to appendix E and an introduction was developed to explain the intended purpose of these tables.

Reference conditions (based on the historic range of variation) were considered when determining the desired conditions. Reference conditions are considered a "best" estimate of a resilient and functioning ecosystem because they reflect the evolutionary and historical ecology of forests. Because the desired conditions in the Forest Plan generally describe this range of variation, there is room for locally specific desired conditions to be identified. For example, a desired condition in the Ponderosa Pine ERU section allows for openness that typically ranges from 10 percent in more productive sites to 70 percent in the less productive sites. See FW-TerrERU-PP-DC-4. When restoration activities are undertaken, the locally specific desired conditions that are within the historic range of variation described in the Forest Plan would be developed at the project level.

Concern Statement #504: The desired condition in the All Vegetation Types section of the Forest Plan that relates to vegetation providing sustainable amounts of products (see Draft Revised Plan, FW-Veg-All-DC-7) should be re-worded to state, "Vegetation provides sustainable amounts of products such as wood fiber or forage. Livestock grazing and wood fiber harvest activities contribute to aspects of the social, economic, and cultural structure and stability of rural communities." (86-23)

Response: The Forest Plan has been adjusted in response to this comment. The suggestion related to livestock grazing has been incorporated in FW-Graz-DC-1. The suggestion related to wood fiber harvest has been incorporated into the Forest Products section. See FW-Fprod-DC-1.

Concern Statement #69: The Forest Service should provide an exclusion in the vegetation guideline related to mesquite bosques (see Draft Revised Plan FW-Veg-Rip-All-G-4) for vegetation management in utility corridors that might fragment mesquite bosques. (69-4)

Response: This guideline has been modified in response to your comment, but a specific exclusion for utility corridors has not been added because of potential conflicts with the Endangered Species Act or other resources. See FW-Rip-RipType-G-2. The Forest recognizes the necessity and appropriateness of vegetation management within utility corridors in one of the Special Uses desired conditions. See FW-SpecUse-DC-2. The Wildland-Urban Interface (WUI) section in the Forest Plan also contains plan direction related to vegetation management in WUI. See FW-WUI-DC-1 to 10 and FW-WUI-G-1. Utility corridors are considered part of the WUI. The potential conflicts between species and vegetation

resources and utility corridor management will be resolved at the project level based on site-specific information.

Concern Statement #70: The Riparian Forest Types guideline in the Forest Plan related to vegetative diversity (see Draft Revised Plan FW-Veg-Rip-All-G-5) should be adjusted to acknowledge that utility corridors should be maintained at early successional plant species. (69-5)

Response: This guideline has been modified, but a specific exclusion for utility corridors has not been added. See FW-Rip-RipType-G-3. Instead of including individual exceptions in every plan component on vegetation that could impact vegetation management in utility corridors, the Forest Plan addresses the necessity and appropriateness of vegetation management within utility corridors in one of the Special Uses desired conditions. See FW-SpecUse-DC-2. The Wildland-urban Interface (WUI) section in the Forest Plan also contains plan direction related to vegetation management in the WUI. See FW-WUI-DC-1 to 10 and FW-WUI-G-1. Utility corridors are considered part of the WUI. The potential conflicts between vegetation resources and utility corridor management will be resolved at the project level based on site-specific information.

Concern Statement #161: The Forest Plan and the work being done under the Four Forest Restoration Initiative (4FRI) should be evaluated to ensure consistency with the monitoring needs and desired conditions of these two efforts. (65-8, 65-14)

Response: There has been ongoing coordination between the forest plan revision effort and 4FRI to ensure consistency between them and to facilitate implementation of any future project-level decisions under the revised Forest Plan. The 1987 forest plan (as amended) provided a framework for projects under the first 4FRI environmental impact statement, which covered portions of the Coconino and Kaibab National Forests. The revised Forest Plan provides a framework for the projects being proposed under the second 4FRI environmental impact statement, the Rim Country project, which is planned to occur on portions of the Coconino, Apache-Sitgreaves, and Tonto National Forests. For example, the desired conditions, objectives, and guidelines included in the Ponderosa Pine and Mixed Conifer ERUs will guide the projects designed under the Rim Country environmental impact statement and decision. The specific restoration activities are developed and evaluated in separate analysis through this project-level decision making. These decisions must also be consistent with the National Environmental Policy Act (NEPA) and the Forest Service Handbook and Forest Service Manual. These decisions would include analysis and opportunity for public involvement.

Monitoring and evaluation is required by the 1982 Planning Rule provisions to evaluate, document, and report how the Forest Plan is applied, how well it works, and if its purpose and direction remain appropriate. The plan revision team and 4FRI team have reviewed each other's monitoring plans. Efforts were made to align monitoring questions when possible under the first environmental impact statement, and efforts will be made to align monitoring questions under the second 4FRI environmental impact statement. Results from 4FRI monitoring are expected to inform monitoring for the Forest Plan. For example, the 4FRI monitoring question concerning maintenance or promotion of long-term soil productivity in accordance with design features, best management practices, and mitigation measures would inform Forest Plan monitoring question #15: *How much have implemented projects and soil best management practices contributed to protecting soil, reducing accelerated erosion, reducing soil compaction, and maintaining soil and nutrient cycling thus maintaining long term soil productivity?*

Concern Statement #392: The Forest Plan should incorporate the collaboratively-designed Old Growth Protection and Large Tree Retention Strategy developed by public stakeholders for implementation in forest treatment projects associated with the Four Forest Restoration Initiative. (56-38, 84-87, 110-3)

Response: No change to the Forest Plan has been made in response to this comment. The Forest Plan emphasizes old-growth structure throughout the landscape including old trees, and promotes replacement trees so that old growth is sustained over time. See FW-TerrERU-PP-DC-5, 6, and 9. Guidelines would protect old-growth structure from uncharacteristic natural disturbances and develop it where lacking. See FW-TerrERU-PP-G-1 and 2. Another guideline provides guidance for retaining pre-settlement trees, often the largest, oldest, and tallest trees. See FW-TerrERU-PP-G-3.

Concern Statement #211: The Forest Plan should include direction that allows aspen to self-thin and that encourages successional stages and all ages. (56-43)

Response: The Forest Plan has been reorganized to put direction for aspen and maple in a separate section. Desired conditions in this section acknowledge natural disturbance and the presence of all age classes and successional stages. It is not a silvicultural practice to mechanically thin aspen stands. Self-thinning is considered part of natural disturbances and is considered the most appropriate way to encourage the development of successional stages. See FW-TerrERU-AspMpl-DC-1, 2, and 3. As with other resources on the Forest, when a project or activity may impact aspen, it will need to be designed or managed to ensure that the Forest is maintaining or moving toward these desired conditions.

Concern Statement #394: The Forest Plan should recognize aspen as a distinct vegetation type and provide direction to ensure that it moves toward and maintains desired conditions based on historic levels. (56-40, 64-53)

Response: Although aspen is not an ecological response unit, the Forest Plan has been reorganized to put the majority of the direction for aspen and maple in a separate section for ease of use and because of their contributions to scenic integrity and bio-diversity. See FW-TerrERU-AspMpl-DC-1, 2, and 3, FW-TerrERU-AspMpl-O-1, FW-TerrERU-AspMpl-G-1, and a management approach, which states:

> Regularly inspect and maintain fences used to protect aspen and maple to ensure recovery.

Aspen is a component of several ERUs and is referred to in the General Description and Background subsections for Ponderosa Pine, Mixed Conifer, and Spruce-Fir ERUs. It is included in a management approach in the Wildlife, Fish, and Plants section:

> Coordinate with the Arizona Game and Fish Department regarding the State Wildlife Action Plan as well as hunting recommendations for various wildlife populations that would lead to maintenance and improvement of habitat elements such as vegetation, aspen, riparian, and soil condition and productivity.

A guideline in the Livestock Grazing section would promote desired conditions for aspen through the appropriate location and use of structural range improvements. See FW-Graz-G-4.

Concern Statement #213: The Forest Service should adjust the seral stages direction associated with the Interior Chaparral Ecological Response Unit. The proportions of seral stages listed in the table in this section reflect a very monotypic condition that is undesirable and at odds with natural disturbance regimes. (75-65)

Response: The seral stages listed in this table are intended to disclose the desired proportion of seral stages for interior chaparral at the forest scale. The table in this section (along with similar tables included in the plan direction for other ERUs) has been moved to appendix E of the Forest Plan. See table 22. The Introduction for appendix E explains that seral stage proportions for modeled states should be assessed at the scale of the entire ERU within a Forest boundary or greater. Seral stage proportions are rarely, if ever, applied at the project level. These seral stages are intended to reflect the natural disturbance regime, characteristic fire return interval, and the rapid growth of chaparral species following disturbance.

Concern Statement #389: The Forest Plan should consider re-introduction of wolves as a keystone species that can restore aspen populations. (13-2, 56-42)

Response: Reintroduction of species is outside of the scope of the plan. Wildlife populations are managed by the state of Arizona (Arizona Game and Fish Department). However, the topic of reintroductions is addressed by two management approaches in the section on Wildlife, Fish, and Plants, which remind forest managers to:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.
>
> Coordinate with the Arizona Game and Fish Department regarding the State Wildlife Action Plan as well as hunting recommendations for various wildlife populations that would lead to maintenance and improvement of habitat elements such as vegetation, aspen, riparian, and soil condition and productivity.

Updated information on wolf recovery is available on the following website:
http://www.fws.gov/southwest/es/mexicanwolf/

Concern Statement #214: The Forest Plan should include direction to protect the stringers of ponderosa pine that extend into pinyon juniper woodlands from high-intensity fire because they are important habitat for Merriam's turkey and other wildlife. (75-67)

Response: Several adjustments have been made to the Forest Plan to address this comment regarding pine stringers. A discussion on stringers has been added to the General Description and Background for the All Terrestrial ERUs section. The reference to stringers in the pinyon juniper desired conditions was moved to the All Terrestrial ERUs section to acknowledge the value of stringers in other ERUs. See FW-TerrERU-All-DC-4. A guideline was added to the All Terrestrial ERUs section to ensure that stringers are protected from uncharacteristic disturbances to prevent stand replacement and to protect their unique contribution to habitat diversity. See FW-TerrERU-All-G-4.

Concern Statement #215: The Forest Service should adjust the seral stages direction associated with the Ponderosa Pine Ecological Response Unit to provide greater proportion for openings, which are natural component of ponderosa pine and important to wildlife. The Forest Service should explain why the desired condition for early development is set at 0 when early open stages are so important for wildlife. The Forest Service should also explain why mid-age forest and mature/old forest area lumped together because the structural characteristics of these seral stages and their value as wildlife habitat is very different. (75-70, 85-29)

Response: Plan components provide considerable flexibility for forest managers to manage ponderosa pine depending on site specificity and project objectives. The Forest Plan describes ponderosa pine as generally uneven-aged and open with variable sized openings. Openness typically ranges from 10 percent in more productive sites to 70 percent in less productive sites. See FW-TerrERU-PP-DC-4. Additional desired conditions are provided for openness in ponderosa pine that consider elevation, aspect, historical conditions, capability of the site, and position on the landscape. See FW-TerrERU-PP-DC-8 and 10. The Forest Plan also has desired conditions that include a diverse understory composed of perennial grasses,

forbs, and shrubs, of variable heights, density, and age classes, which would provide food and cover for a variety of wildlife. See FW-Terr-ERU-PP-DC-2 and 10.

Seral stage proportions were moved to appendix E in the Forest Plan. See table 17 for reference percentages for Ponderosa Pine ERU. The early development seral stage is described as recently burned grass, forb, and shrub types and is 0 percent because the grass, forb, and shrub types that result from wildfire are generally uncharacteristic and not desirable. The seral stage table has been clarified to explain that the early development states represent larger than desired openings being created by wildfires, with undesired effects and with a longer time period to return to a forested state. The open (less than 30 percent cover) seral stages are the seral stages that would provide the majority of the grass, forb, and shrub understory so important to wildlife. The combination of the young forest, mid-age forest, and mature/old forest w/regeneration states (the open seral stages) are nearly 91 percent of the Ponderosa Pine ERU. Note that these are uneven-aged predominantly open stages that contain all ages of trees dispersed as groups, clumps, and individual trees. The seral stage table has been modified to clarify that the desired openings for grass, forb, and shrub understory vegetation are built into open single-storied states and throughout the multistoried states, but are not identified separately.

It is correct that mid-age forest and mature/old forest with regeneration have different structural characteristics, which have different values to wildlife. These states have been combined to account for differences in site productivity across the Forest and to acknowledge that not all areas of the Forest have the capacity to have predominantly large to very large trees. The seral stage table explains that low productivity sites are more likely to have a predominance of medium-open/uneven-aged characteristics whereas high-productivity sites are more likely to have a predominance of very large-open/uneven-aged conditions.

The seral stages listed in the table that was included Ponderosa Pine ERU section are intended to represent the desired proportion of seral stages for ponderosa pine at the forest scale. The proportions were not adjusted in response to these comments. This table (along with similar tables included in the plan direction for other ERUs) has been moved to appendix E of the Forest Plan and is now identified as table 17. The Introduction for appendix E explains that seral stage proportions for modeled states should be assessed at the scale of the entire ERU within a Forest boundary or greater. Collectively, the table plus the more detailed text in the Forest Plan comprise the desired conditions. Seral stage proportions are rarely, if ever, applied at the project level. Because these seral stages only apply at these very broad scales, they should not conflict with variations in seral stages that are associated with natural disturbance regimes observed at the project level.

The seral stage table for ponderosa pine in appendix E has been modified to clarify that recently burned (in the Early Development state) refers to larger than desired openings being created primarily by stand-replacing wildfire when it occurs in closed canopy states (State N). This would result in a longer time period required to move back to a forested state compared to characteristic wildfires. The early development state also includes characteristic states, which existed in reference conditions (State A).

The desired condition is to have characteristic fire sustain predominantly open ponderosa pine. Predominantly open conditions would support herbaceous plants, properly functioning soil, natural disturbance regimes, and all-aged vegetation structure. See FW-TerrERU-PP-DC-2, 3, 4, 8, 10, and 13.

In table 17, mid-aged forest and mature/old forest are combined to reflect the intermix of age classes present at the landscape level. This would reflect landscape-scale desired conditions of a mosaic of trees of various age classes; of trees in structural stages that range from young to old; an arrangement of individual trees, small clumps and groups interspersed with variably sized openings; groups of similarly aged trees and single trees interspersed with open interspaces; and various proportions of patches with

different developmental stages. See FW-TerrERU-PP-1, 4, 6. It is important to note that the desired openings for grass, forb, and shrub understory vegetation is built into the multistoried (uneven-aged) states and is not identified separately.

Concern Statement #230: The Forest Plan should allow for larger openings and group sizes for the Ponderosa Pine ERU at the fine scale. (75-72)

Response: Although the Ponderosa Pine ERU desired condition in question addresses openings at the fine scale, it does not apply any particular size to them. See FW-TerrERU-PP-DC-13. Opening sizes are addressed in the landscape-scale and mid-scale desired conditions. See FW-TerrERU-PP-DC-4 and 8. Because no size was prescribed for openings at the fine scale, no adjustment has been made in response to this part of the comment.

However, a size was assigned to groups (typically less than 1 acre) at the fine scale. See FW-TerrERU-PP-DC-13. The desired condition did note that group sizes may be larger in areas managed for bald eagles and Mexican spotted owls. In response to this comment, the Ponderosa Pine ERU desired condition has been adjusted to acknowledge that group sizes may be larger when there is site-specific information indicating that historically the group was larger. See FW-TerrERU-PP-DC-13.

Concern Statement #289: The Forest Plan should include an expanded discussion on the historical range of variation and the potential natural vegetation type of ponderosa pine. (65-6)

Response: The desired conditions for the Ponderosa Pine ERU (formerly the Ponderosa Pine Potential Natural Vegetation Type) were developed by the Regional Office using the best available science, including General Technical Reference (GTR) 310 (Reynolds et al. 2013), which is included in the References section of the Forest Plan. These references address the historic range of variation of ponderosa pine in the Southwest. For an example of the historic range of variation included in GTR-310 that has been incorporated into the Forest Plan, please review the Ponderosa Pine ERU desired condition that allows for openness that typically ranges from 10 percent in more productive sites to 70 percent in the less productive sites. See FW-TerrERU-PP-DC-4.

Concern Statement #403: Remove the reference to mixed conifer in desired condition 18. (86-36)

Response: The desired condition has been adjusted in response to the comment. The reference to mixed conifer types has been removed from the component. See FW-TerrERU-PP-DC-14.

Concern Statement #216: The Forest Plan objective for Ponderosa Pine ERU should clarify that "free thinning" includes selective cutting or add selective cutting to the list of examples. (75-74)

Response: The Forest Plan has been adjusted in response to this comment. Free thinning and group selection were provided as examples of prescribed cutting included in an objective in for the Ponderosa Pine ERU. These examples have been removed from the objective. See FW-TerrERU-PP-O-1. However, a definition for "prescribed cutting" has been added to the Glossary in the Forest Plan. The definition does not try to make an exhaustive list of prescribed cutting techniques. Rather, the definition states that prescribed cutting is:

> Vegetation removal under conditions specified in an approved plan to remove unwanted fuels; create openings; stimulate growth of desired vegetation; change seral stages; and to meet range, wildlife, recreation, wilderness, watershed, or timber management objectives.

"Free thinning" was not clarified to include "selective cutting" because these are different cutting methods. Free thinning is the thinning of trees to achieve a target density, but there is not structural target

specified. This practice usually retains the best trees of all sizes and species. Selective cutting is a general term that is typically used to imply the use of either single tree selection or group selection cutting. Both single tree selection and group selection cutting are uneven-aged management systems that focus on desired density as well as structural targets.

Concern Statement #217: The Forest Plan should recognize group sizes for Mixed Conifer Frequent Fire ERUs that reflect the historic range of variability. (75-76)

Response: The desired condition has been clarified to address your comment. It now expressly acknowledges that group sizes in the mixed conifer frequent fire ERU may be larger than 1 acre when there is site-specific information indicating that the group was larger historically. See FW-TerrERU-MCFF-DC-11.

Concern Statement #496: The Forest Plan should provide a shorter time period for the completion of the mixed conifer frequent fire ERU treatment objective. (87-4)

Response: The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, the objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

The Forest Plan also includes treatment objectives for the Ponderosa Pine ERU, which could result in additional treatment in the upper portion of Rio de Flag drainage. See FW-TerrERU-PP-O-1, 2, and 3. The Forest Plan also provides a comprehensive framework for management of the wildland-urban interface. See FW-WUI section.

Concern Statement #220: The Forest Plan should establish vegetation height to provide hiding cover for pronghorn. (64-34)

Response: No particular understory height or composition has been identified in the Forest Plan. No particular grass height or grazing season has been set in the Forest Plan. These decisions will be made at the project level based on site-specific information. The Forest Plan will guide these site-specific decisions with plan components that address grasslands, wildlife habitat, and livestock grazing management. For examples, see FW-TerrERU-Grass-DC-4 and 8, FW-WFP-DC-2 and 3, FW-Graz-DC-2, and FW-Graz-G-2. A management approach in the forestwide Grasslands section clarifies the site-specific nature of these types of decision. It reminds forest managers that:

> Species-specific wildlife needs are addressed on a site-specific basis and considered during project-level planning and implementation. For example, where they occur, pronghorn typically benefit from grasses and shrubs greater than 11 inches in height to provide fawns protection from predators during the fawning season (AZGFD 2011b). This habitat consideration is, however, dependent in large part on weather and site capability. Optimal fawning habitat conditions may not always be achievable due to variable environmental conditions (e.g., winter snowfall and spring precipitation). Project specialists work together to determine achievable conditions that would optimize wildlife habitat at the site level, and give consideration to follow-up monitoring that could assess how well such conditions have been met.

Another management approach in Wildlife, Fish, and Plants reminds managers to consider current literature and best available science when making site-specific decisions. It reads:

> Use current literature and the best available science when making site-specific decisions relevant to project planning. This is done in an interdisciplinary context with input from other resource

specialists. For example; the guideline specifying disturbance buffers around raptor nests (FW-WFP-G-11) is intended as a minimum buffer. Some raptor species (such as osprey) are more adapted to disturbance and are likely to tolerate a buffer of just 300 yards during the breeding season while other, less tolerant species (such as peregrine falcons (*Falco peregrinus*)) may require buffers of up to a one-half mile. Wildlife biologists work with other resource specialists to identify and define the appropriate site-specific buffers (within the context of plan guidance) for other raptors on a case-by-case basis.

Concern Statement #237: The Forest Plan should clarify the purpose of the Grassland guideline to place new stock tanks and wildlife waters in locations that reduce concentrations of grazing animals and subsequent vegetation and soil effects in open areas. (75-63)

Response: The Forest Plan has been adjusted in response to this comment. This Grassland ERU guideline has been adjusted to clarify that the intent is to protect grassland composition, structure, and productivity and soil function by, among other things, strategically locating constructed waters. See FW-TerrERU-Grass-G-2. The Forest Plan has also been modified to account for conditions immediately adjacent to livestock concentration areas, such as waters, that might be different than general desired conditions for vegetation and soil. See FW-Graz-DC-2.

Concern Statement #288: The Forest Plan should include direction on specific ways to protect alpine tundra ERU from major human disturbances, such developed recreation from the Arizona Snowbowl ski area and year-round dispersed recreation. This direction should include an objective for the alpine tundra habitat type. (56-44, 56-47)

Response: The Forest Plan provides broad guidance and information for project decision making and is strategic in nature. It does not contain project and activity decisions such as particular actions to address potential threats to a species or habitat type. Decisions to take particular actions to address potential threats to a species or habitat type are determined during project-level planning, which would include recreation special-use permits such as the Arizona Snowbowl ski area.

No objectives have been added for the Alpine Tundra ERU. However, the Forest Plan does contain direction that encourages maintenance, protection, and improvement of alpine tundra. Desired conditions for the Alpine Tundra ERU support and sustain rare or narrowly endemic species and provide habitat for San Francisco Peaks ragwort, a federally listed species and other native biota. See FW-TerrERU-AT-DC-1 and 2. Because proposed projects and activities must be consistent with these and other desired conditions (see description of desired conditions in the Plan Decisions section in chapter 1 of the Forest Plan), an objective for the alpine tundra habitat type is not necessary.

Plan language includes a guideline in Alpine Tundra ERU and standards and guidelines in the Designated Wilderness Areas section specific to the Kachina Peaks Wilderness (which contains alpine tundra) that protect and maintain this sensitive resource. See FW-TerrERU-AT-G-1, SA-Wild-S-3, 4, 5; SA-Wild-G-9. An objective for Designated Wilderness Areas would rehabilitate wilderness sites that have been impacted by recreation. See SA-Wild-O-1. Desired conditions in the Designated Wilderness Areas section emphasize education, interpretation and wilderness resources, as do several guidelines. See SA-Wild-DC-2, 3, 9, 10, and 11. Plan standards related to the Kachina Peaks Wilderness further protect alpine tundra by only allowing recreational activities off trail when there is sufficient snowpack; by prohibiting overnight camping and recreational livestock; and by avoiding important habitat for the San Francisco Peaks ragwort when constructing new routes. See SA-Wild-S-3, 4, and 5.

In addition, desired conditions in the Recreation and the Special Uses sections promote recreation opportunities balanced with the capacity of forest resources to support them, minimal user and resource

conflicts, and compatibility with resource protection. See FW-SpecUse-DC-7 and FW-Rec-All-DC-6. Other plan components protect alpine tundra by not allowing horse and pack stock on Humphrey's Trail and Weatherford Trail above Doyle Saddle, and not permitting recreational livestock in the watersheds draining into the Inner Basin Management Area. See MA-Peaks-S-1 and 3 and MA-InBsn-S-1.

Concern Statement #406: The standard in the Alpine Tundra section of the Forest Plan that addresses important habitat for the threatened San Francisco Peaks ragwort (*Packera franciscana*) (see Draft Revised Plan, FW-Veg-AT-S-1) should clarify what is meant by important habitat (i.e., is it designated critical habitat, occupied habitat, habitat with a high density of plants). (86-42)

Response: This standard has been adjusted in response to this comment. This component was moved to the Wilderness section and separated into a standard that addresses recreational activities in the alpine tundra ERU and another standard that addresses new route construction in San Francisco Peaks ragwort habitat. See SA-Wild-S-3 and 5. The second standard includes examples of things that could be considered important habitat, such as designated critical habitat, occupied habitat, and high density of plants. See SA-Wild-S-5.

Concern Statement #348: The Forest Plan should use consistent desired conditions for grasslands. (58-5)

Response: The Forest Plan has been adjusted in response to this comment. The tables identifying seral stage and cover ranges in the Grasslands section have been moved to appendix E of the Forest Plan. To ensure consistency between the grassland types, the tables have been modified to display VDDT model states and reference percentages for each grassland type. See tables 23, 24, and 25 in appendix E.

These tables were moved to appendix E because the inclusion of this information in chapter 2 of the Forest Plan was causing confusion over how the information in the tables should be used. The seral stage proportions for modeled states included in these tables is for assessment at the scale of the entire ERU within a Forest boundary or greater. Seral stage proportions are rarely, if ever, applied at the project level. For instance, the application of seral stage values for spruce-fir forests that typically have long stand replacement intervals and large patch dynamics, may only be appropriate at subregional scales. To emphasize that the seral stage values in these tables were not intended, in most cases, to be applied at the project level, this information was moved to appendix E and an introduction was developed to explain the intended purpose of these tables.

To provide consistent direction on desired plant composition in grasslands, a Grasslands desired condition was adjusted to indicate that desired plant composition is similar to site potential and site potential is determined by Terrestrial Ecological Unit Inventory or other appropriate ecological classification system. See FW-TerrERU-Grass-DC-1. Accordingly, the actual desired plant composition will be determined at the project level based on site-specific conditions found in the project area.

Concern Statement #318: The desired conditions in the Forest Plan should be re-examined because they appear to be moving away from multiple use to single use management (restoration). As currently worded, the desired conditions could be barriers to wildlife habitat enhancement projects, especially in small scale areas. For example, the operation and maintenance of wildlife water may become a conflict to restoration of vegetation on a site such as a small stand of low elevation aspen. (77-8, 94-8)

Response: Unless otherwise indicated, the desired conditions in the Forest Plan are designed to be applied at the landscape scale. On their face, some desired conditions may appear to conflict with other desired conditions as suggested in the comment. These apparent conflicts are addressed at the project level by assessing the proposed project or activity at the appropriate spatial scale. For example, balancing

management concerns for aspen (see FW-TerrERU-AspMpl-DC-1, 2, and 3), wildlife habitat (see FW-WFP-DC-1, 2, and 3), and wildlife waters (see FW-ConstWat-DC-1) occur at the project level using site-specific information. As noted in the Plan Decisions section in chapter 1 of the Forest Plan, there are several ways to demonstrate that a project or activity is consistent with the desired conditions in the Forest Plan. Impacts to aspen at a very small scale may be unlikely to prevent the Forest from maintaining or moving toward the overall desired conditions for aspen found in the Forest Plan. Documentation for such a project should explain how the project is consistent with desired conditions and describe any short-term or negligible long-term adverse effects the project may have concerning the maintenance or attainment of any desired condition.

Concern Statement #349: The guideline in the Semi-Desert Grasslands section of the Forest Plan that addresses roads and trails (see Draft Revised Plan, FW-Veg-Grass-SDG-G-2) should be adjusted to clarify if it only applies to new roads and trails or to all roads and trails. (58-7)

Response: This guideline has been moved to the Wildlife, Fish, and Plants section of the Forest Plan to give it forestwide application, rather than limiting it to the semi-desert grassland ERU. See FW-WFP-G-13. In response to this comment, this guideline has been clarified to apply only to new road and new trail locations.

Concern Statement #351: The guideline in the All Grassland Types section of the Forest Plan that addresses key pronghorn fawning areas during fawning season (see Draft Revised Plan, FW-Veg-Grass-All-G-1) should state that disturbance from management activities will be "avoided" rather than "minimized" because the guideline uses the verb "should" instead of "will be." (85-27)

Response: This guideline has been merged with other plan components related to timing restrictions and moved to the Wildlife, Fish, and Plants section to create a more strategic guideline that generally addresses these types of concerns. See FW-WFP-G-8. Although the verb has not been changed from "should be" to "will be," to be consistent with the Forest Plan, projects and activities must apply timing restrictions unless they can meet the intent of the guideline (to minimize or avoid impacts to survival or successful reproduction) another way. See discussion on guidelines in the Plan Decisions section in chapter 1 of the Forest Plan.

A management approach to the Wildlife, Fish, and Plants section of the revised Plan provides additional clarity for this guideline. It reminds forest managers that:

> The application of timing restrictions, like those referenced in FW-WFP-S-2 and FW-WFP-G-8, will be based on site-specific information and may vary depending on variables such as species, weather, timing of activity relative to species life cycle, or duration, frequency, and type of activities that are occurring in the species' habitat. Other variables to be considered could include the duration, extent, and intensity of the proposed activity, or the type of activity itself, such as emergency or safety-related actions versus non-emergency activities. The best available information and science is utilized to develop timing restrictions to reduce impacts to disturbance sensitive species.

Concern Statement #411: A management approach in the Grassland Types section of the Forest Plan should be adjusted to add the U.S. Fish and Wildlife Service as a partner for coordinating on objectives for wildlife conservation, education, habitat restoration, and improvements and to recommend adding the black-footed ferret *(Mustela nigripes*) to the list of priority grassland species (management approach lists pronghorn and prairie dogs). (86-32)

Response: The management approach in the Grasslands section has been adjusted in response to this comment. It now states:

Coordinate with Arizona Game and Fish Department (AZGFD) and U.S. Fish and Wildlife Service on objectives for wildlife conservation, education, habitat restoration, and improvements, particularly regarding pronghorn, prairie dogs, and black-footed ferrets.

Concern Statement #350: Snags are not specifically identified in the linked definition of structure, nor coarse woody debris in the All Vegetation desired condition (see Draft Revised Plan, FW-Veg-All-DC-2), so the desired condition should be adjusted to mention snags specifically, or snags should be included in the definition of structure. (85-23)

Response: The definition of "structure" in the Glossary for the Forest Plan has been adjusted to include "snags." Snags are discussed in greater detail in the desired conditions for specific ERUs. For example, see FW-TerrERU-PJ-DC-2, 5, and 7.

Concern Statement #353: The Forest Plan should include direction for snags in the fine scale desired conditions in the Mixed Conifer with Infrequent Fire section, which involves areas of less than 10 acres. (85-31)

Response: Snags have not been included in the fine-scale desired conditions for the Mixed Conifer with Infrequent Fire ERU. Snags are part of the desired conditions for the landscape and mid-scales in the Mixed Conifer with Infrequent Fire ERU. See FW-TerrERU-MC-MCIF-DC-2, 3, 4, and 6. The desired conditions promote conditions that reflect the disturbance regime of this ERU including variably sized patches of trees, which are frequently in the hundreds of acres, and old-growth structure over large areas as stands or patches where old-growth components are concentrated, including snags. Older declining trees that are a component of this ERU provide for snags and are well-distributed throughout the landscape. See FW-TerrERU-MC-MCIF-DC-1, 2, 3. Snag densities differ by seral stages that reflect disturbance regimes. See FW-TerrERU-MC-MCIF-DC-6. Given the disturbance regime associated with this ERU (mixed or high fire severity with a fire return interval of 35 to 200 or more years), and single tree to isolated group torching in moister conditions, snags would be expected in a variety of seral stages, across the landscape, and predominantly in larger patch sizes, and thus, are not described at the fine scale as part of desired conditions. See FW-TerrERU-MC-MCIF-DC-7.

Concern Statement #388: The Forest Plan should make fire the preferred treatment whenever tree removal is a priority within Pinyon Juniper ERUs. (26-2, 56-49)

Response: No change has been made in response to this comment. Decisions to treat, and how to treat, pinyon juniper are based on site-specific analysis and made at the project level. Fire or fuelwooding may be effective treatments in some cases, but perhaps not all.

The Forest Plan provides the framework for projects to select the most effective treatment to move toward desired conditions. For example, pinyon seedling survival is promoted in a desired condition. See FW-TerrERU-DC-PJ-15. Management approaches in the Forest Products section (where fuelwood is addressed) remind forest managers to promote the use of forest products as a result of forest management activities and encourage use of forest products in lieu of onsite burning or chipping.

Concern Statement #396: The Forest Plan should emphasize the use of naturally-adapted fire disturbance in old-growth ecosystem restoration. (84-78)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan provides the framework for projects to select the most effective treatment (mechanical, prescribed fire, or a combination of the two) to move toward desired conditions for the various ERUs. Decisions to treat, and how to treat, old-growth ecosystems are based on site-specific analysis and made at the project level.

Concern Statement #393: The Forest Plan should consider different approaches (e.g., fire-resistant landscape features) for the strategic location of fuel treatments. Prioritize fuel treatments at locations where relatively little resource investment may create fire resistant conditions in the shortest amount of time. (84-86)

Response: The Forest Plan contains objectives to treat vegetation using fire treatments. See FW-TerrERU-PJ-O-2 and 3, FW-TerrERU-PP-2 and 3, and FW-TerrERU-MC-MCFF-2 and 3. The priority for restoration treatments (including fuel treatments) is to treat priority watersheds. See FW-Water-G-2.

Different approaches for the strategic location of fuels treatments would be identified during the Forest's annual and out-year program of work development. Costs (based on location, extent of treatment) and benefits of implementing treatments would be considered before selecting specific locations to treat.

Concern Statement #395: The Forest Plan should include restrictions on the cutting or removal of pinyon pine. (56-51)

Response: No change has been made in response to this comment. Decisions to treat, and how to treat, pinyon juniper are based on site-specific analysis and made at the project level.

The Forest Plan provides the framework for projects to select the most effective treatment to move toward desired conditions for the various Pinyon Juniper ERUs. Recognizing the importance of pinyon pines, one desired condition expressly promotes seedling survival for this species. See FW-TerrERU-DC-PJ-15.

Concern Statement #397: The Forest Plan should include standards and guidelines that specifically address the problem of fragmentation of old-growth habitat and apply spatially-explicit analysis demonstrating that functional old-growth ecosystems will be sustained over time. (84-80)

Response: No change has been made to the Forest Plan in response to this comment. The fragmentation concept is not applicable for frequent fire forests in the Southwest such as ponderosa pine; it is applicable to infrequent-fire forest ecosystems where large blocks of even-aged old growth develops and persists over long periods of time (e.g., coastal Douglas-fir or high-elevation spruce-fir), based on the ecology of those forests. In southwestern frequent-fire forests, old growth is naturally fragmented, and occurs as tree groups, clumps, individual trees, and occasional patches in an uneven-aged forest landscape (Reynolds et al. 2013).

Desired conditions in Mixed Conifer with Infrequent Fire ERU and Spruce-Fir ERU promote large areas of old-growth structure because these two ERUs have longer fire return intervals and different fire regimes than the frequent fire regime of ponderosa pine. See FW-TerrERU-MC-MCIF-DC-1 and 2 and FW-TerrERU-SF-DC-2. Old growth patch sizes in Pinyon Juniper Woodland ERU can also be large. See FW-TerrERU-PJ-DC-10.

The revised plan has numerous plan components that focus on functioning ecosystems and sustaining ecosystems processes and contributions. An example is a desired condition in All Ecosystems (FW-Eco-DC-1) that states:

> Within their type and capability, ecosystems are functioning properly, provide habitat for native species, and are resilient to natural disturbances (e.g., flooding, fire, and periodic drought) and climate change. Ecosystem processes and contributions (e.g., nutrient cycling, water infiltration, and wildlife habitat) are sustained as vegetation on the Forest adapts to a changing climate.

Inherent in the concept of having sustainable ecosystems is having a mosaic of vegetative conditions, at a variety of scales and watersheds, which reflect natural disturbance regimes that are functioning properly within their type and capability and that are resilient to the frequency, extent, intensity, and severity of

disturbances. Vegetative conditions include old growth, as well as the younger age classes, which are integral to having old growth through time. This is exemplified by desired conditions in the Terrestrial ERU section. See FW-TerrERU-All-DC-1 and 2; FW-TerrERU-MC-MCFF-DC-4; FW-TerrERU-MC-MCIF-DC-4; FW-TerrERU-SF-DC-1. Forest and woodland ERUs have desired conditions to have old-growth components scattered across the landscape. For example, see FW-TerrERU-PJ-DC-7 and 11; FW-TerrERU-PP-DC-5, 6, FW-TerrERU-MC-MCFF-DC-3; and FW-TerrERU-SF-DC-2 and 3.

The Forest Plan recognizes that the location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality), such as in FW-TerrERU-PP-DC-6, FW-TerrERU-PJ-DC-5; FW-TerrERU-MC-MCFF-DC-2; and FW-TerrERU-MC-MCIF-DC-2. Yet the protection and retention of old growth is also addressed as is the development of old-growth conditions where it is currently lacking. See FW-TerrERU-PP-G-1, 2, 3, 4, and 5; FW-TerrERU-PJ-G-5; and FW-TerrERU-MC-All-G-3.

Concern Statement #398: The guideline in the All Vegetation section of the Forest Plan that discusses the use of even-aged silvicultural practices as a strategy for old tree retention (see Draft Revised Plan, FW-Veg-All-G-2) should clarify how even-aged management can be used as a strategy for old tree retention (and as opposed to other silvicultural treatments). (85-25)

Response: This guideline has been adjusted in response to this comment. The language in the guideline has been adjusted to have more general and strategic application. As adjusted, the guideline directs management activities such as vegetation treatments or other restoration actions should be designed to maintain or move toward desired conditions, but does not specifically address particular silvicultural practices or desired conditions, such as amounts of old growth. See FW-TerrERU-All-G-1. This would include management for desired old growth components expressed in the desired conditions for the individual ERUs covered in the Forest Plan. When vegetation treatments or other restoration actions are developed, it is a standard practice to consider a variety of silvicultural practices, including even-aged, uneven-aged, and the use of fire as strategies to achieve the desired conditions over the long term. Even-aged cutting methods may be necessary in certain circumstances, such as bringing mistletoe infection levels to within a sustainable range.

Concern Statement #218: The Forest Plan should be adjusted to identify endemic plant communities of concern and address populations of rare plants, which are components of plant communities. (75-59, 75-60)

Response: The endemic species currently being considered are being addressed in the environmental impact statement. A list of endemic species of concern is not being included in the Forest Plan because it will change over time. Several plan components address endemic rare plants, including populations and metapopulations. See FW-WFP-DC-1, 2, and 5, and FW-WFP-G-10.

Concern Statement #400: Concern that not all rare plants are endemic and not all endemic plants are rare (See FW-Veg-All-DC-13). (86-26)

Response: The reference to endemic rare plant communities has been adjusted in response to this comment. This component was merged with a similar desired condition in the Wildlife, Fish, and Plants section. That desired condition does not use the term “endemic rare plant communities.” See FW-WFP-DC-5.

Concern Statement #401: The Forest Service should modify the All Vegetation Types standard that addresses clearcutting (see Draft Revised Plan FW-Veg-All-A-1). As worded, the standard implies the Forest Service will be clearcutting vegetation as a rule, rather than used as tool under particular circumstances. We recommend re-wording this standard to state “Uneven-aged management and

free thinning will be used as cutting methods unless it is determined through site-specific analysis that clear-cutting is the optimum method for a particular area to make progress toward desired conditions. The maximum size opening that may be created using the clear-cut method shall not exceed 40 acres…." (86-28)

Response: This standard has been separated into two standards in response to your comment. . One standard states that clearcutting shall only be used as a cutting method where it is determined through site-specific analysis to be the optimum method for a particular area to make progress toward desired conditions. The other standard clarifies that the maximum size opening that may be created in one harvest operation for the purpose of creating an even-aged stand shall not exceed 40 acres except when it is following a large-scale disturbance event such as a stand-replacing fire, wind storm, or insect or disease outbreak. See FW-TerrERU-All-S-3 and 4.

Concern Statement #402: The Forest Service should use Dr. Stromberg's work regarding the description of mesquite bosques. See Stromberg, J.C. 1993. Riparian Mesquite Forests: A Review of Their Ecology, Threats, and Recovery Potential. Journal of the Arizona-Nevada Academy of Science. 27 (1):111-124. (86-30)

Response: The desired condition that addresses mesquite bosques has been adjusted in response to this comment. Using Dr. Stromberg's information, the General Description and Background subsection in the Riparian Forest Types section has been modified. Rather than stating mesquite bosques should be open and park-like, mesquite bosques are described as having connected canopies with an open understory. A desired condition now recognizes that a variety of age classes should be present, including seedling, sapling, mature, and overmature trees. See FW-Rip-RipType-DC-6.

Concern Statement #405: The Forest Plan should explain how the desires for the majority of the Spruce-Fir forest to be in mature/old forest state and for northern goshawk nest areas to relatively be even more dense work together. (86-40)

Response: In some locations, post-fledging areas (PFAs) in the Spruce-Fir ERU may contain greater tree density than surrounding areas, as is typical in some northern goshawk PFAs. In other areas, tree density may be the same as surrounding areas. Conditions in the Spruce-Fir ERU are intended to be a reflection of natural levels of disturbance and succession. The scale, location, and intensity of site-specific disturbances would result in variability in tree density from which northern goshawks could select suitable nesting areas, around which PFAs could be established. See FW-TerrERU-SF-DC-1, 2, 8, and 10. Natural disturbances and processes are also promoted in wilderness. A large proportion of the Spruce-Fir ERU occurs in the Kachina Peaks Wilderness. See SA-Wild-DC-1, 3, and 4.

Concern Statement #410: The desired condition in the Ponderosa Pine section of the Forest Plan that discusses wildlife home ranges (see Draft Revised Plan, FW-Veg-PP-DC-3) should be adjusted to focus the discussion on the PNVT, not specific wildlife home ranges, such as northern goshawk. (86-34)

Response: No change has been made in response to this comment. The reference to northern goshawk in this desired condition is only to indicate that fire is characteristic within and outside of the home range for northern goshawk. See FW-TerrERU-PP-DC-3.

Concern Statement #412: The Forest Plan should ensure that there is consultation with utility companies whenever seeding is proposed in utilities rights-of-way that pass through pinyon juniper vegetation to ensure seeded vegetation is compatible with utility lines and structures. (69-7)

Response: The Forest Plan has been adjusted in response to this suggestion. Rather than add a specific guideline to the Pinyon Juniper ERU section of the Forest Plan, a management approach was added to the

All Ecosystems section, which ensures broader consideration of the stated concern instead of limiting it to the Pinyon Juniper ERU. The All Ecosystems management approach states:

> Coordinate with neighboring jurisdictions, permit holders (including utilities and livestock permittees), and other interested parties when undertaking activities in permitted areas or easements.

Concern Statement #413: The Forest Plan should exclude utility companies from being required to retain snags, large ponderosa pine and Gambel oak, and ponderosa pine greater than nine inches in diameter in protected Mexican spotted owl habitat. (69-8, 69-10, 69-27)

Response: The Forest Plan has not been adjusted in response to these comments. However, the concern related to vegetation management in utility rights-of-way is addressed in other plan direction in the Special Uses section. Vegetation clearing in utility corridors that meets legal mandates is a desired condition. See FW-SpecUse-DC-2. A guideline further clarifies that vegetation in utility corridors is only retained if it does not interfere with meeting vegetation clearing requirements for the corridor. See FW-SpecUse-G-6.

Removal of snags, large ponderosa pine and Gambel oak trees, and ponderosa pine greater than 9 inches in diameter in protected Mexican spotted owl habitat could create potential conflicts with the Endangered Species Act or other resources. These conflicts would be worked out at the project level based on site-specific information.

Concern Statement #414: The ponderosa pine guideline to avoid utility vegetation maintenance from April to June (see Draft Revised Plan FW-Veg-PP-G-6) should be adjusted because it is not always possible to conduct the maintenance activities during these time periods. (69-11)

Response: This guideline has been adjusted in response to this comment. The language has been adjusted to have broader, more strategic application and focuses on uncharacteristic bark beetle outbreaks. See FW-TerrERU-PP-G-6. Site-specific conditions rather than broad timing restrictions would be used to manage levels of green slash. A similar guideline has been added to the Pinyon Juniper ERU section. See FW-TerrERU-PJ-G-3.

Concern Statement #491: The Forest Plan should include direction that ensures management of areas adjacent to Wupatki National Monument and Sunset Crater Volcano National Monument is consistent with and beneficial to those national monuments. The Forest Plan should also include direction to maintain the desired scenic experience along Forest Road 545, which is used by 180,000 visitors to the Sunset Crater Volcano National Monument annually. (86-59)

Response: The Forest Plan contains plan components that ensure the areas adjacent to Wupatki National Monument and Sunset Crater Volcano National Monument are managed in a manner that may be beneficial to these national monuments. Desired conditions seek to have vegetation on the Forest functioning properly within its type and capability. See FW-TerrERU-All-DC-2. The Forest Plan also provides specific desired conditions for the Great Basin Grassland, Montane/Subalpine Grassland, and Pinyon Juniper with Grass Ecological Response Units. See FW-TerrERU-Grass-DC-1 to 9, and FW-TerrERU-PJ-DC-1 to 5.

Plan components in the Painted Desert and Volcanic Woodlands Management Area also promote management that would be beneficial to and compatible with Sunset Crater Volcano and Walnut Canyon National Monuments including preservation of cultural sites and archaeological sites, unroaded landscapes, and clearly delineated boundaries. See MA-PntdDsrt-DC-1, 2; MA-VolcanWd-DC-3, 4; MA-VolcanWd-G-1.

The Forest Plan includes the Strawberry Crater Recommended Wilderness Area, which could have some of the favorable results suggested in the comment. Desired conditions for recommended wilderness areas seek to maintain or enhance primitive and undeveloped characteristics and emphasize scenery. See SA-RWild-DC-1 and 3.

The Forest Plan does not provide management direction specific to Forest Road 545. Those types of decisions are made at the project level based on site-specific information. However, the Forest Plan does provide a framework that ensures the concerns regarding management of this road are considered. The Roads and Facilities section includes a desired conditions for roads and road corridors to be managed with scenery in mind. See RdsFac-DC-1 and 2. Likewise, both the Painted Desert and Volcanic Woodlands Management Areas include desired conditions for scenery. See MA- PntdDsrt-DC-3 and MA-VolcanWd-DC-5. Furthermore, management approaches in the Painted Desert and Volcanic Woodlands Management Areas remind forest managers to coordinate with the National Park Service to develop and ensure compatible management of overlapping resources in these management areas.

Concern Statement #204: The Forest Plan should manage the grasslands in Bonito Park and Deadman Wash in conjunction with the Sunset Crater Volcano National Monument and the Wupatki National Monument. (56-56)

Response: A management approach has been added to the Volcanic Woodlands Management Area and Painted Desert Management Area in response to your comment. The management approach encourages coordination with the National Park Service as follows:

> Coordinate with the National Park Service to develop and ensure compatible management of overlapping resources in this management area.

A forestwide desired condition in the Land Adjustments section also addresses this comment. It seeks for most of the Forest to have natural-appearing landscapes that have not lost their wildland character and to retain open space values, including those related to naturally appearing landscapes, wildlife habitat, riparian/wetland character, and recreational opportunities. See FW-LndAdj-DC-1.

Concern Statement #492: The desired condition in the All Vegetation section of the Forest Plan that addresses unique plant community habitats (see Draft Revised Plan, FW-Veg-All-DC-14) should be adjusted to include caves/karst/pseudokarst and acknowledge cave entrances as inter ecotone access points. (80-19)

Response: The Forest Plan has been adjusted in response to this comment. Caves and karst have been added to the list of examples of physical elements discussed in the desired condition. See FW-WFP-DC-5. The listed examples are not intended to be an exhaustive list of all possible physical elements.

Concern Statement #502: The Forest Plan should include direction that requires the assessment and designation of old-growth habitat at site, watershed, and ecosystem scale and limit treatments in these areas to activities that enhance old-growth characteristics. (84-79)

Response: The Forest Plan does not direct projects on how to inventory old growth and instead relies on the projects to determine how to inventory and assess old growth depending on the scale and type of project and information available. The Forest Plan focuses on desired conditions. The Forest Plan's desired conditions were developed to provide for a flow of old-growth conditions and function over time and space that reflect natural disturbance regimes at a variety of scales. These scales can include individual trees or groups, stands, or large areas that could incorporate one or more watersheds. This could correlate with site and watershed scales mentioned in the comment and even the ecosystem scale, depending on the disturbance. Ecological functions mediated by fire and other natural disturbances include the presence and distribution of coarse woody debris, downed logs, snags, and older declining

trees. The desired conditions provide for the presence of these characteristics, as well as spatial shifting or transition of old growth on the landscape over time, reflecting natural disturbance regimes.

Plan components for the growth, maintenance, and protection of old growth is in numerous locations in the Forest Plan including, but not limited to, FW-TerrERU-DC-PP-6, 7, and 9, FW-TerrERU-PP-G-1, 2, and 4. Additional plan components relating to a pre-settlement tree strategy can be found in FW-TerrERU-PP-G-3; FW-TerrERU-MC-MCFF-DC-2 and 4; FW-TerrERU-MC-MCIF-DC-2 and 4; FW-TerrERU-MC-All-G-2 and 3; and FW-TerrERU-DC-SF-2, 4, and 11.

That said, desired conditions focus on a spectrum of vegetative age classes and structure that are inclusive of, but not exclusive to, old growth. Specific treatments might be needed where existing conditions differ from desired conditions. This would be decided at the project level.

Concern Statement #503: The Forest Plan should contain direction to maintain and develop well-defined blocks of old growth in each project-level assessment area, in each Ranger District, and across the Coconino National Forest. (84-81)

Response: Plan components for the growth, maintenance, and protection of old growth are in numerous locations in the Forest Plan including, but not limited to, FW-TerrERU-DC-PP-6, 7, and 9, FW-TerrERU-PP-G-1, 2, and 4. Additional plan components relating to a pre-settlement tree strategy can be found in FW-TerrERU-PP-G-3, FW-TerrERU-MC-MCFF-DC-2 and 4, FW-TerrERU-MC-MCIF-DC-2 and 4, FW-TerrERU-MC-All-G-2 and 3, and FW-TerrERU-DC-SF-2, 4, and 11.

The Forest Plan's approach is that each ERU has a mosaic of vegetation conditions, densities, and structures, at a variety of scales across landscapes and watersheds, reflecting the natural disturbance regimes. See FW-TerrERU-All-DC-1. This mosaic is across the ERU and varies between ERUs depending in a large part on the natural disturbance regime. For example, ponderosa pine old-growth structure would be scattered across the landscape consistent with low-severity frequent fire return intervals, whereas old growth in Mixed Conifer with Infrequent Fire would be in larger patches consistent with a mixed to high-severity infrequent fire return interval. Old growth would be assessed at the project level, but the Forest Plan does not require it to be allocated at the project or district level.

Concern Statement #505: The desired condition in the All Vegetation section of the Forest Plan related to rare and culturally important plants (see Draft Revised Plan, FW-Veg-All-DC-10) should be re-worded to state, "Rare and culturally important plant species and their habitats are protected and enhanced."(86-25)

Response: The Forest Plan has been adjusted in response to this comment. This desired condition has been removed because enhancement and protection of rare and culturally important plant habitat is addressed in other sections of the Forest Plan. Desired conditions for rare plants are included in the Wildlife, Fish, and Plants section. See FW-WFP-DC-1 and 2. Plan components for culturally important plants are included in the Tribal Relations and Uses section. See FW-Trbl-DC-2 and 3, FW-Trbl-G-1, and a Tribal Relations and Uses management approach, which states:

> The Coconino NF and area tribes have a mutual interest in maintaining healthy, sustainable populations of plants and other resources important for traditional and cultural purposes. Work with area tribes to identify, collaboratively manage, and monitor these resources, as well as build and maintain more detailed information about culturally important plants. Continue to manage the land in a spirit of shared stewardship with the tribes.

Concern Statement #506: The Forest Plan should clarify and enhance the desired condition related to success and survival of pollinators and identify the specific pollinators of interest. (75-58, 86-27)

Response: The Forest Plan has been adjusted in response to this comment. This topic is addressed in the All Ecosystems section, which includes a desired condition for ecosystem conditions to promote endemic levels of pollinators. See FW-Eco-DC-4. Furthermore, a reference to the National Pollinator Best Management Practices has been added to the All Ecosystems section in appendix D, Other Sources of Information.

The Forest Plan does not identify particular pollinators of interest; they will be identified at the project level based on site-specific information.

Concern Statement #507: The first desired condition in the Riparian Types section of the Forest Plan (see Draft Revised Plan, FW-Veg-Rip-All-DC-1) should be edited to remove the last sentence. This sentence does not add to the description of what is desired and gives a negative connotation to what is supposed to be a positive statement. (86-29)

Response: The Forest Plan has been adjusted in response to this comment. The sentence referencing impacts from livestock grazing has been removed. See FW-Rip-RipType-DC-1. Management of livestock grazing, and other authorized activities, are addressed in guidelines under Riparian Forest Types and Livestock Grazing. See FW-Rip-RipType-G-3 and FW-Graz-G-1, 2, 4, 5, and 7.

Concern Statement #508: The Forest Service should review the statement in the General Description and Background for the Mixed Conifer with Infrequent Fire ERU that this ERU historically had over 10 percent tree cover, with the exception of early, post-fire plant communities. This amount of tree cover seems very low for mixed conifer. (86-37)

Response: The Forest Plan has been adjusted in response to this comment. The sentence referring to the historic level of tree cover in the General Description and Background for the Mixed Conifer with Infrequent Fire ERU and Mixed Conifer with Frequent Fire has been removed for clarity. As the ERUs were being delineated in the early stages of plan revision, the Forest used a definition of forest land as an area that is capable of sustaining at least 10 percent canopy cover at maturity (USDA 2014). In the early developmental stages of the plan, both mixed conifer types were combined, even though Mixed Conifer with Frequent Fire has different structure and fire return interval than mixed conifer with infrequent fire. The original intent of the "10 percent tree cover" statement was to explain generally how forest lands were distinguished from nonforest lands. Over time, it became apparent that this statement was an unnecessary and potentially confusing part of General Description and Background for mixed conifer, however it was inadvertently left in when the Draft Environmental Impact Statement was published. *USDA Forest Service. 2014. Forest Inventory and Analysis National Core Field Guide. Volume I: Field Data Collection Procedures for Phase 2 Plots. Version 6.1. 433 p. (Available online at: http://www.fia.fs.fed.us/library/field-guides-methods-proc/index.php*.)

Concern Statement #510: The Forest Service should review the Great Basin and montane/subalpine grasslands guideline that directs toward a 90 percent vegetative ground cover (see FW-Veg-Grass-GB&MSG-G-1) and the information in table 4, which suggests that desired vegetative ground cover can range from 20 to 90 percent depending on soil type. The guideline should be adjusted to a range of vegetative ground cover from 20 to 90 percent, depending on soil type, as listed in table 4. (58-8)

Response: The Forest Plan has been adjusted in response to this comment. The guideline suggesting 90 percent vegetative ground cover for Great Basin and montane/subalpine grasslands has been removed from the Forest Plan as has the table listing the desired cover ranges for grasslands. The desired level of vegetative ground cover to reduce erosion and gully formation, and maintain soil function and productivity is addressed in the Soil section. See FW-Soil-DC-3. Plant composition in grasslands is

desired to be similar to site potential (greater than 66 percent), as determined by the Terrestrial Ecological Unit Inventory or other appropriate ecological classification system. See FW-TerrERU-Grass-DC-1.

Concern Statement #511: The desired condition in the All Vegetation Types section of the Forest Plan that discusses how vegetation should provide sustainable amounts of products (see Draft Revise Plan, FW-Veg-All-DC-7) should be adjusted to refer to "ecologically" sustainable amounts of products. (85-24)

Response: The Forest Plan has been adjusted in response to this comment. The term "ecologically" has been added to modify "sustainable amounts of products." See FW-TerrERU-All-DC-5.

Concern Statement #512: The Great Basin and Montane/Subalpine Grasslands guideline in the Forest Plan that relates to the placement of stock tanks and wildlife water developments (see Draft Revised Plan, FW-Veg-Grass-GB&MSG-G-2) should be clarified. By their very function, stock tanks and wildlife water developments will increase concentrations of grazing animals, in open or closed areas. (85-28)

Response: The Forest Plan has been adjusted in response to this comment. The guideline was poorly worded, which allowed for unintended interpretations. The guideline has been reworded to more broadly address the concern of grassland composition, structure, and productivity and soil function and suggest some actions that could be used to address the concern. See FW-TerrERU-Grass-G-2. We also modified a desired condition in Livestock Grazing to account for conditions immediately adjacent to areas where livestock are likely to concentrate. See FW-Graz-DC-2.

Concern Statement #513: The ponderosa pine guideline in the Forest Plan that references snags (see Draft Revised Plan, FW-Veg-PP-G-5) should be adjusted to clarify that it refers to the "the largest and tallest snags representative for that stand" because research in multiple forest types has demonstrated that snag-roosting bats (at least 10 of the Coconino's 21 species) often prefer the largest and tallest snags in a stand. (85-30)

Response: The Forest Plan has been adjusted in response to this comment. The guideline was edited to place an emphasis on the largest and tallest snags representative of the stand. See FW-TerrERU-PP-G-5.

Concern Statement #514: The Forest Plan should define what is meant by old-growth forest structures in the mixed conifer frequent fire guidelines. (85-32)

Response: The Forest Plan has been adjusted in response to this comment. Additional detail regarding old-growth forest structures was not added into these guidelines. The desired elements associated with old-growth structure are discussed in the desired conditions for the Mixed Conifer Frequent Fire ERU. See FW-MC-MCFF-DC-2 and 3.

Concern Statement #516: The Forest Plan should limit the unnecessary construction of artificial waters and include a guideline that artificial water sources be kept at a distance from aspen patches to protect the trees from elk and cattle. (56-41)

Response: The Forest Plan has been adjusted in response to this comment. Several guidelines associated with range developments were merged to create one guideline on this topic. See FW-Graz-G-4. This guideline requires structural range improvements to be located, constructed, reconstructed, maintained, and used in a manner that is consistent with the desired conditions of other resources on the Forest, including aspen. The guideline also requires the consideration of modifying, relocating, or removing existing range improvements that are found to be incompatible with those desired conditions.

The need for the construction of any particular artificial waters would be addressed at the project level.

Concern Statement #517: The Forest Plan should favor the use of fire or fuelwooding over mechanical treatment for restoration of pinyon juniper vegetation. (24-3, 24-4, 26-1, 56-50)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan is programmatic in nature and does not make decisions on specific mechanical treatment techniques to be employed in specific situations. Decisions to treat, and how to treat, pinyon juniper will be based on site-specific analysis and made at the project level. Prescribed fire or fuelwooding may be an effective treatment in some cases, but not others.

The Forest Plan provides the framework for projects to select the most effective treatment (including but not limited to mechanical, prescribed fire, or a combination of the two) to move toward desired conditions for the various ERUs. A management approach in the All Terrestrial ERU section reminds forest managers:

> Fire is essential for ecosystem function and for maintaining or moving toward desired conditions in ecosystems where fire is the primary natural disturbance. Primary natural disturbances in Desert Communities, Alpine Tundra, and riparian areas do not include fire, but rather include flooding, precipitation, temperature, wind, avalanches, and ultraviolet radiation. When used as a tool, fire can effectively restore forest structure when used alone or when combined with mechanical treatments. Mechanical treatments may be costly, so the capacity to implement such treatments across the landscape may be limited. Strategic placement and design of mechanical treatments increases their effectiveness in protecting values at risk.

Another management approach for Forest Products (where fuelwood is addressed) reminds forest managers to promote the use of forest products as a result of forest management activities and encourages use of forest products in lieu of onsite burning or chipping.

Concern Statement #519: The Forest Plan should be adjusted to correct the apparent contradiction between the fire intervals discussed in to Interior Chaparral desired conditions (see Draft Revised Plan FW-Veg-IC-DC-1 and 3). (75-66)

Response: The Forest Plan has been adjusted in response to this comment. The desired conditions related to fire in the Interior Chaparral ERU have been grouped into one desired condition to remove the apparent contradiction. See FW-TerrERU-IC-DC-3.

Concern Statement #520: The Forest Plan should also include prescribed fire objectives for grasslands because prescribed fire is an important and cost-effective tool in early stages of woody vegetation encroachment into grasslands and for maintaining these areas after mechanical treatment. (75-62)

Response: The Forest Plan has been adjusted in response to this comment. The term "mechanically" has been removed from all three grassland objectives. See FW-TerrERU-Grass-O-1, 2, and 3. The adjusted objectives provide more strategic direction, which allows the appropriate treatment options to be identified at the project level based on site-specific information.

Concern Statement #521: The Forest Service should carefully consider the commitments associated with the vegetation restoration objectives in the Forest Plan (such as FW-Veg-Grass-SDG-O-1 – to mechanically restore/ enhance 3,500 acres of semi-desert grasslands) and the potential consequences for failing to meet those measurable and anticipated objectives. (44-8)

Response: The Forest Plan has been adjusted in response to this comment. The Plan Decisions section in chapter 1 of the Forest Plan contains descriptions of the various types of plan components used in the Forest Plan, including objectives. The description of what an objective is and is not has been adjusted to

clarify that these statements are not targets, but projections, and that they may not be fully achieved based on a variety of factors.

A definition for the term "restoration" has been added to the Glossary. It states that restoration is:

> The process of assisting in the recovery of an ecosystem that has been degraded, damaged, or destroyed (Society for Ecological Restoration International 2004). Ecological restoration focuses on establishing or re-establishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystem sustainability, resilience, and health under current and future conditions. Accordingly, any project or activity that assists in the recovery of a degraded, damaged, or destroyed ecosystem can be considered restoration. Restoration can be active or passive. Treatments that move ecosystem components toward desired conditions are considered restoration, as are removal of impacts. Allowing natural processes to move ecosystem components toward desired conditions can also assist in the recovery of an ecosystem. General Technical Report RMRS-GTR-310 provides a framework for restoration of ponderosa pine and mixed conifer with frequent fire (Reynolds et al. 2013).

Concern Statement #522: The Forest Plan should clarify what historic patterns of vegetation means and consider using the terms "pre-settlement conditions" and "historical range of natural variability" as more appropriate benchmarks for management. (75-71, 75-73, 75-75, 75-77, 75-79, 75-82)

Response: The Forest Plan has been adjusted in response to this comment and to clarify what is meant when a plan component refers to historic vegetation conditions. See the definition for "historic vegetation conditions" in the Glossary.

Concern Statement #523: The Forest Plan should include an objective for treatments to enhance aspen and recruitment. (75-81)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan includes an objective to restore at least 1,000 acres of aspen and maple. See FW-TerrERU-AspMpl-O-1.

Concern Statement #524: The Forest Plan should allow the use of desirable, non-native plant materials to support restoration activities when native plant materials are either unavailable or cost-prohibitive. (75-68)

Response: The Forest Plan has been adjusted in response to this comment. The guideline addressing the use of native species to support restoration activities has been adjusted to apply to all terrestrial ERUs and to acknowledge that use of desirable, non-native plant materials may be allowed where native plant materials are unavailable, cost-prohibitive, insufficient to address site-specific problems, and the non-native plant materials do not impede re-establishment of native species. See FW-TerrERU-All-G-3.

Concern Statement #525: The Forest Plan should not limit the landscape application of a variety of restoration tools, such as those being used by the Four Forest Restoration Initiative. (82-4)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan does not limit the size of landscape restoration efforts, nor does it limit restoration tools that could be used.

Concern Statement #526: The Forest Plan should include specific vegetation, range condition, and invasive species direction for the Beaver Creek area. (99-8)

Response: The topics of vegetation, range condition, and invasive species have been addressed in forestwide direction. For guidance on vegetation conditions, see the plan components in the forestwide

direction for All Ecosystems, Riparian Areas, and Terrestrial Ecological Response Units. For guidance on invasive species, see the plan components in the forestwide direction for Invasive Species. Direction in the Verde Valley Management Area, which includes the Beaver Creek area, also addresses watershed condition, riparian function, native and invasive species. See MA-VerdeV-DC-1, MA-VerdeV-G-1.

Concern Statement #540: The Forest Plan should retain all protections for native species. (769-1)

Response: In addition to existing law, regulation, and policy related to the protection of native species, the Forest Plan provides a comprehensive framework for the protection of native species. For examples, see FW-Eco-DC-1 and 4; FW-Water-DC-6; FW-Water-G-6; FW-Rip-Strm-G-1; FW-Rip-Wtlnds-DC-1 and 2; FW-Rip-Spr-DC-2; FW-Rip-Spr-G-3; FW-Rip-RipType-DC-2 and 6; FW-Rip-RipType-G-2; FW-TerrERU-All-G-3; FW-TerrERU-DC-DC-2 and 4; FW-TerrERU-Grass-DC-1 and 2; FW-TerrERU-IC-DC-1, 2, and 3; FW-TerrERU-PJ-DC-3, 4 and 9; FW-TerrERU-AspMpl-DC-1; FW-TerrERU-MC-All-DC-2: FW-TerrERU-MC-MCIF-DC-1; FW-TerrERU-SF-DC-1; FW-TerrERU-AT-DC-1 and 2; FW-TerrERU-AT-G-1; FW-WFP-DC-1, 2, 3, 4, 9, and 10; FW-WFP-G-3; FW-Invas-DC-1; FW-Invas-G-1 and 2; FW-Graz-G-7; FW-RdsFac-G-9; FW-Rec-Dev-G-2: and FW-Scenic-DC-1.

Concern Statement #543: The Forest Plan should explain how northern goshawk post-fledging family areas (PFAs), foraging areas, and nest areas differ from the general forest conditions described in the ponderosa pine desired conditions. (86-35)

Response: The Forest Plan has been adjusted in response to this comment. The desired condition that describes the differences in the Ponderosa Pine ERU depending on the type of habitat it provides for northern goshawk has been edited to better describe the forest conditions associated with PFAs, foraging areas, and nest areas. See FW-TerrERU-PP-DC-12.

Concern Statement #547: The Forest Plan should include guidance on the grassland conditions that are beneficial for pronghorn fawning. (64-30)

Response: The Forest Plan has been adjusted in response to this comment. A management approach has been added to the Grasslands ERU section reminding forest managers that:

> Species-specific wildlife needs are addressed on a site-specific basis and considered during project-level planning and implementation. For example, where they occur, pronghorn typically benefit from grasses and shrubs greater than 11 inches in height to provide fawns protection from predators during the fawning season (AZGFD 2011b). This habitat consideration is, however, dependent in large part on weather and site capability. Optimal fawning habitat conditions may not always be achievable due to variable environmental conditions (such as winter snowfall and spring precipitation). Project specialists work together to determine achievable conditions that would optimize wildlife habitat at the site level, and give consideration to follow-up monitoring that could assess how well such conditions have been met.

The Forest Plan contains additional direction that is beneficial to pronghorn fawning. See FW-ConsWat-DC-2, FW-TerrERU-Grass-DC-8, and FW-WFP-G-13.

Concern Statement #554: The Forest Plan should ensure that aspen and maple restoration efforts are not undertaken in utility corridors. (69-2)

Response: In addition to desired conditions for aspen and maple, the Forest Plan includes a desired condition relating to the legal mandates for vegetation clearing in utility and energy transmission corridors. See FW-TerrERU-AspMpl-DC-1, 2, and 3 and FW-SpecUse-DC-2. A project proposing to pursue aspen or maple restoration within a utility corridor, would need to be consistent with the Special Uses desired condition or it would require a plan amendment. It is highly unlikely that the Forest would

use its limited restoration budget on efforts to restore or enhance aspen or maple in areas like utility corridors where the vegetation is being actively managed.

Concern Statement #555: The Forest Plan should include direction for coordination of prescribed fire activities with utility fire liaisons. (69-6)

Response: The Forest Plan includes a management approach in the Fire Management section that reminds forest managers to:

> Coordinate with other jurisdictions such as communities, service providers (infrastructure), and Federal, State, county, and local entities regarding prevention, preparedness, planned activities, and responses to wildland fires. Notify the above regarding the upcoming and ongoing fire season and any prescribed fire activity.

Concern Statement #591: The Forest Plan should include a desired condition that addresses the cultural importance of the Alpine Tundra ERU. (86-41)

Response: The Forest Plan has information and plan direction that recognizes the cultural importance of the Alpine Tundra ERU. The General Description and Background for the Alpine Tundra section of the Forest Plan states that the Alpine Tundra ERU is probably the most significant cultural area on the Coconino NF for many tribes in the Southwest. The San Francisco Peaks Management Area, which includes all of the Alpine Tundra ERU on the Forest includes a desired condition that states the San Francisco Peaks provide a traditional cultural and religious setting for many American Indian tribes and are recognized as sacred to these tribes. See MA-Peaks-DC-1. The General Description and Background for the San Francisco Peaks Management Area recognizes that most of this management area is within the San Francisco Peaks Traditional Cultural Property.

Concern Statement #603: The Forest Plan should recognize that aspen and maple reproduction and suckering create uneven-aged structure. (75-80)

Response: While it is true that seeding and suckering can in some cases create uneven-aged patches of aspen, across the landscape aspen is primarily present in even-aged patches as a consequence of its historic disturbance regime.

Concern Statement #609: The Forest Plan objective to treat 1,000 acres of aspen and maple should be increased to treat more aspen at a faster rate. (64-40)

Response: No change has been made in response to this comment. The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, the objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded, should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

Concern Statement #611: The Forest Plan should better recognize aspen patches as a desired component in the Mixed Conifer Aspen ERUs. (75-78)

Response: The Forest Plan has been adjusted in response to this comment. A new section has been created to address aspen and maple. The General Description and Background for the Aspen and Maple section acknowledges that aspen primarily occurs in the Mixed Conifer with Infrequent Fire (formerly called Mixed Conifer with Aspen) and Spruce-Fir ERUs, but may also be found in cool moist locations in the Mixed Conifer with Frequent Fire and Ponderosa Pine ERUs. A desired condition in this new section also addresses these concerns. See FW-TerrERU-AspMpl-DC-1.

In addition, aspen has been added to a desired condition for Mixed Conifer with Infrequent Fire. See FW-TerrERU-MC-MCIF-DC-5.

Concern Statement #626: The objectives for vegetation treatment in the Forest Plan should be adjusted. As worded, it appears that the Forest intends to treat the expressed acreages every year, which would lead to some areas being treated 3 to 5 times every 10 years. (34-2)

Response: The Forest Plan has been adjusted in response to this comment. As worded, it was possible to interpret the objective to mean that the acres listed would be treated annually, not spread out over 10 years. The objectives have been adjusted to clarify that acres of treatment would occur during each 10-year period over the life of the plan, not annually for 10 years. See FW-TerrERU-Grass-1, 2, and 3; FW-TerrERU-PJ-O-1, 2, and 3; FW-TerrERU-AspMpl-O-1; FW-TerrERU-PP-1, 2, and 3; and FW-TerrERU-MC-MCFF-O-1, 2, and 3.

Concern Statement #634: The Forest Plan should adjust the pinyon juniper with grass objective to include prescribed fire in addition to naturally ignited wildfires. (75-69)

Response: No change has been made in response to this comment. It is true that attaining this projected treatment level would depend on the location of ignitions, conditions at the time of ignition, and resources at risk. However, given historical levels of natural ignitions in the Pinyon Juniper with Grass ERU, it is projected that over a 10-year period it is likely that this objective will be met relying on naturally ignited wildfires. Furthermore, prescribed fire in the ERU would not be prohibited because it is not expressly included in an objective.

Concern Statement #640: The Forest Service should consider an alternative that quantitatively assesses vegetation to ensure continued ecosystem function and sufficient forage for native ungulates and domestic livestock. (64-6)

Response: The Coconino NF considered this alternative, but did not analyze it in detail in the environmental impact statement because the desire to have functioning landscapes, including enough vegetation for ecosystem functioning and forage for native ungulates and domestic livestock, is provided for by plan components for vegetation in the other alternatives that were considered in detail. Plan components in the sections on Livestock Grazing and Wildlife, Fish, and Plants also provide for forage and ecosystem functioning. Specialists determined that quantitative analysis as requested is not practical at the forest plan level because climate, site conditions, the number and types of wildlife (such as pronghorn, elk, mule deer, and white-tail deer), utilization, types of forage (grass, forbs, shrubs), and season of use by wildlife of those sites can vary annually and on a longer term basis. Furthermore, agency policy exists for evaluating the range conditions, drought, and determining permitted levels of livestock grazing on the Forest and so would provide for adequate ecosystem function.

Concern Statement #687: The EIS should provide a scaled analysis of the current status and projected future structure, composition, extent and distribution of old growth and compare effects of alternatives. (84-76)

Response: In the Forest Plan, old growth is addressed as a component of vegetation structure within each forested and woodland ERU, and within riparian forests. This older component includes size and age classes and specific habitat features (i.e., old trees, dead trees (snags), downed wood (coarse woody debris)) rather than old growth as a unique vegetation type of its own. The scale in which old forest structure develops differs depending on the ecology of each forest type. For frequent fire forest types, old forest structure characteristically develops at the fine scale (sub-stand), and infrequently at the midscale (stand scale). For infrequent fire forest types, old forest structure characteristically develops as mid-scale patches (stand scale), patterned in the footprints of previous high-severity fires.

Analyses on the distribution, extent, and components of vegetation structure using the Vegetation Dynamics Development Tool (VDDT) model did make this comparison by alternative for current and future timeframes. Results are summarized in the Vegetation and Fire section of the environmental impact statement and detailed in the Vegetation and Fire Specialist Report (USDA Forest Service 2016a). Vegetation structural states representing late developmental or "climax" forest for each ERU were modeled. Some old trees and other old-growth components are also included at the fine scale within the younger structural states modeled in VDDT. This analysis was conducted at the forestwide level, which includes aggregations of all three scales set forth in the plan. A more detailed analysis of existing old growth is not required.

During plan implementation and project design, the Coconino NF conducts analyses using a variety of sources of forest succession and vegetation structural data that inform and consider the existing spatial extent, distribution, and structural qualities of old growth at different scales when comparing existing conditions to desired conditions.

Concern Statement #692: The Forest Service should disclose benefits and potential liabilities of using prescribed fire at broad spatial scales to reduce risk, provide ecosystem services, and regulate greenhouse gas emissions. (84-95)

Response: The Vegetation and Fire section in chapter 3 of the environmental impact statement discusses the application of fire on the landscape at broad spatial scales. It compares the existing fire regime condition class (FRCC) by alternative to determine the percent of the Forest that would move toward desired conditions, thus reducing the risk of uncharacteristic wildfires and discusses the impacts to vegetation structure. It also outlines how the alternatives vary in their emphasis of treatments near wildland-urban interface, thus reducing the hazards from uncharacteristic wildfires. Other sections in chapter 3 of the environmental impact statement (e.g., Watersheds and Water, Wildlife, Fish, and Plants, Livestock Grazing, Forest Products, Scenic Resources) describe the effect of fire on resources that provide ecosystem services.

As discussed in the Air Quality section in chapter 3 of the environmental impact statement, limits to smoke emissions (including greenhouse gases such as carbon dioxide) from prescribed fires are imposed by the Arizona Department of Environmental Quality. The Air Quality section also acknowledges that the Forest coordinates with Arizona Department of Environmental Quality on the management of wildfires and may use emission reduction techniques to mitigate their impact on air quality.

The Climate Change section in chapter 3 of the environmental impact statement discusses how mechanical and prescribed fire treatments can help regulate greenhouse gas emissions. This section includes information on how thinning and prescribed burning can result in reduced carbon dioxide emissions when compared to a wildfire. The reductions in carbon dioxide emissions are even greater on subsequent treatments.

Concern Statement #699: The Forest Service should provide information on current and historic levels of aspen and state the specific number of acres of aspen that are desired on the Forest. (64-41)

Response: There is no exact information available to the Forest regarding the estimated historic number of acres of aspen on the Coconino NF, nor does the Forest have an estimate of current acres of aspen. However, it is acknowledged that historically there were many more acres of aspen than are present today. The Coconino NF, like the rest of the West, has seen a dramatic decline in aspen. This decline is attributable to altered fire regimes and heavy browsing by ungulates combined with fires, insect defoliators, drought, and the inability of aspen regeneration to survive browsing. This has resulted in conversion of aspen to coniferous forest (Fairweather and others 2007, USDA Forest Service 2009).

Aspen are not a separate ERU, but a shade-intolerant component of the Ponderosa Pine, Mixed Conifer, and Spruce-Fir ERUs. Aspen are adapted to disturbances like fire and windthrow, and represent an early successional stage in these ERUs. As with the ERUs in general, the Forest Plan does not specify a certain number of acres of aspen that would be desirable on the Forest. Rather, the Forest Plan includes a desired condition for aspen to shift across the landscape as a result of succession and disturbance. See FW-TerrERU-AspMpl-DC-2. This is consistent with aspen's role in the Ponderosa Pine, Mixed Conifer, and Spruce-Fir ERUs. Other plan components address the reasons aspen has declined. Desired conditions seek to return the Ponderosa Pine, Mixed Conifer, and Spruce-Fir ERUs to their natural fire regimes. See FW-TerrERU-DC-PP-3; FW-TerrERU-MC-MCFF-DC-5, FW-TerrERU-MC-MCIF-DC-7, and FW-TerrERU-SF-DC-5. A guideline in the Aspen and Maple section directs aspen to be protected from excessive herbivory using methods such as fencing that protect regeneration and recruitment. FW-TerrERU-AspMpl-G-1. While these components do not express the exact number of acres of aspen that would be desired on the Forest, they will ensure that management actions on the Forest lead to conditions that will allow aspen to move toward more historic levels.

Additional information on aspen is available in the Vegetation and Fire Specialist Report (USDA Forest Service 2016a) included in the project record.

Concern Statement #712: The Forest Service should explain why mechanical treatment is necessary to restore the Pinyon Juniper Grassland Ecological Response Unit instead of just allowing fire to play its natural role in maintaining conditions. (32-1)

Response: The environmental impact statement contains information that explains why mechanical treatment may be necessary to the Pinyon Juniper Grassland Ecological Response Unit (ERU) instead of just allowing fire to play its natural role in maintaining conditions. The Vegetation and Fire section in the environmental impact statement includes information about the fire regime and return interval for the Pinyon Juniper with Grass ERU and explains that this ERU has pronounced departures in composition and structure that are the result of fire exclusion. For example, in some cases higher than normal canopy cover suppresses understory grasses. This creates conditions where there is not enough understory fuel to carry fire at sufficient intensity to fulfil its natural role. These departed attributes do not allow for the natural fire disturbance cycle and create a risk of uncharacteristic wildfire occurring in the ERU. By mechanically treating the overstory to reduce canopy cover we create the conditions where understory vegetation can become reestablished. Once reference conditions have been restored, it will be appropriate to allow fire to resume its natural role in this ERU (moderate surface fire spread, limited torching, and low tree mortality (in mostly smaller stems)). See the discussion on Pinyon Juniper with Grass in the Affected Environment section for Vegetation and Fire in the environmental impact statement for additional information.

Concern Statement #718: The Forest Service should consider the effect of activity-created fuels on fire hazard. Disclose how much slash may remain on the ground after logging in different vegetation types. Look at slash fuels and treatment options on fire hazard and ecosystem resilience, particularly on steep slopes where prescribed fire may not be used due to operability constraints. Provide plan guidance for management of activity-created fuels. (84-85)

Response: The Forest Plan provides a programmatic framework that guides site-specific actions, but does not authorize, fund, or carry out any project or activity. Because the Forest Plan does not authorize or mandate any site-specific projects or activities (including ground-disturbing actions), there can be no direct effects. However, there may be implications, or long-term environmental consequences, of managing the forests under this programmatic framework. The environmental impact statement addresses this implication and the Forest Plan provides direction on how site-specific projects should address activity-created fuels.

The environmental impact statement acknowledges that mechanical treatment can create undesirable levels of activity-created fuels. For this reason, most acres that are mechanically treated would be subsequently treated with prescribed fire and maintained with repeated fire treatments over the years. See Assumptions for Vegetation and Fire in appendix C of the Final Environmental Impact Statement. Exactly how much slash may remain on the ground after a treatment and how that will affect fire hazard in the treated area will depend on the project area, including steep slopes, and the vegetation that is being treated. Anticipated results of this nature would be determined and disclosed as part of a project-level analysis and decision.

The Forest Plan addresses activity-created fuels in several ways. The Forest Plan includes the natural fire regime in the desired conditions for each of the forested ERUs on the Coconino NF. These fire regimes define the fire severity that is desirable in each of these ERUs. For example, see FW-TerrERU-PJ-DC-3, 8, 13; FW-TerrERU-PP-DC-3; FW-TerrERU-MC-MCFF-DC-5; FW-TerrERU-MC-MCIF-DC-4. To meet these desired conditions, projects would be managed to ensure that activity-created fuels would not create a situation that could alter the desired fire severity in a particular ERU.

The Forest Plan also provides desired conditions for coarse woody debris in many of the ERUs. Where mechanical treatment is most likely to occur (Pinyon Juniper, Ponderosa Pine, Mixed Conifer Frequent Fire, and Mixed Conifer with Infrequent Fire ERUs), the Forest Plan describes the desired amount of coarse woody debris in tons per acre. See FW-TerrERU-PJ-DC-2, 7, and 12; FW-TerrERU-PP-DC-5; FW-TerrERU-MC-MCFF-DC-3; and FW-TerrERU-MC-MCIF-DC-2. In addition to these desired conditions, the Forest Plan has a guideline specific to Pinyon Juniper ERUs that would design slash treatments to improve herbaceous vegetation growth, watershed condition, and soil productivity. See FW-TerrERU-PJ-G-3. Another guideline manages slash to minimize impacts from Ips beetles (which would protect Mexican spotted owl habitat) and to provide habitat for small mammals which Mexican spotted owl feed on. See FW-Veg PP-G-6. Finally, additional guidelines recognize that some slash piles are desirable and provide guidance on the circumstances when these activity-created fuels should be maintained. See FW-TerrERU-PJ-G-4; FW-TerrERU-PP-G-7; and FW-TerrERU-MC-G-1. All of this guidance would be used in project design to manage activity-created fuels at the project level.

Concern Statement #719: The Forest Service should limit fuel treatments in mixed conifer to the driest sites (i.e., south and west aspects) where fire suppression is most likely to have caused long-term change in forest composition and structure, consistent with the principles described above. Such treatments should focus on reducing the density of small stems (i.e., less than 16 inches d.b.h.) of shade-tolerant species that comprise "ladder fuels," and emphasize increasing canopy base height at stand scales. The objective of such treatments should be to disrupt vertical sub-canopy fuel continuity so that surface fires are less likely to initiate crown fires. (56-58)

Response: The decision to restore an area and what techniques might be appropriate would be made at the project level based on site-specific conditions, not at the forest plan level. Site-specific conditions would include current and desired vegetation conditions, aspect, topography, accessibility, fire or disturbance history, threats, and other resource values.

Concern Statement #728: The Forest Service should not create exclosures on aspen, but should use burning as a restoration strategy with a focus on areas above 9,000 feet in elevation. (21-2)

Response: The Forest Plan provides the framework for projects to select the most effective treatment (mechanical, prescribed fire, or a combination of the two or a physical barrier that would deter herbivory) to move toward desired conditions for the various ERUs. Decisions to treat, and how to treat, aspen ecosystems are based on site-specific analysis and made at the project level.

Concern Statement #731: The Forest Service should ensure that crown bulk density calculations and estimates have professional and scientific integrity and are developed with site-specific information based on field observations. The Forest Service should also assess fuel treatment effects on the likelihood of crown fire initiation and spread, by considering: (1) surface fuel density and arrangement; (2) canopy base height; (3) local topography; and (4) weather patterns. (84-83, 84-84)

Response: The Forest Plan is a programmatic document that describes broad trends. Projects that propose specific actions are analyzed at the project level and would include a site-specific analysis by a fire and fuels specialist when appropriate. The relevant site-specific report would include an assessment of the composition and spatial arrangement of combustible material across the project area as well as the effects of any proposed fuel treatment.

Concern Statement #734: The Forest Service should conduct a landscape-scale assessment of forest restoration needs and target restoration on areas most likely to benefit from active intervention. (84-69)

Response: The Coconino NF's forest plan revision effort resulted in a landscape-scale assessment of forest restoration need at a broad scale. In chapter 3 of the environmental impact statement being prepared for this effort, the Vegetation and Fire section and the Riparian section identify restoration needs by describing the disparity between desired conditions and current conditions for each ERU and riparian area on the Forest.

To address these disparities, the Forest Plan includes objectives for treatment in specific ERUS and riparian areas. See FW-TerrERU-Grass-O-1, 2, and 3; FW-TerrERU-PJ-O-1, 2, and 3; FW-TerrERU-AspMpl-O-1; FW-TerrERU-PP-O-1, 2, and 3; FW-TerrERU-MC-MCFF-1, 2, and 3; FW-Rip-Wtlnds-O-1; FW-Rip-Spr-O-1; and FW-WFP-O-4. Objectives are not targets, but projections, and they may not be fully achieved based on a variety of factors. The objectives in the Forest Plan are not designed to entirely resolve departures from desired conditions or to resolve them as quickly as possible. Rather, objectives are measurable results designed to maintain or move the Forest toward desired conditions. Objectives are based on anticipated budget and staffing and can be exceeded, should the opportunity arise. See the discussion on objectives in the Plan Content section in chapter 1 of the Forest Plan for additional information on objectives.

The decision to restore an area and what techniques might be appropriate (e.g., active or passive restoration) would be made at the project level based on site-specific conditions, not at the forest plan level. Site-specific conditions that help inform a decision on where restoration may be appropriate include the gap between current and desired vegetation conditions, fire or disturbance history, threats, and other resource values in the area. The decision on whether wildland fire is the appropriate tool for use at a particular time and place is decided at the time of natural ignition. Wildland fire may be a tool in areas where mechanical treatments are not appropriate, such as in wilderness. Considerations in deciding whether wildland fire is an appropriate tool could include, but are not limited to, fuel loading, proximity of wildland-urban interface, threats to life and property, fire regime, capacity to manage the fire, and weather.

Concern Statement #740: The Forest Service should not group montane grassland and subalpine grasslands together as one resource; they are two separate things. (20-2)

Response: The Forest agrees that Montane/Subalpine Grasslands Ecological Response Unit consists of two separate subtypes. Both the Forest Plan and the environmental impact statement recognize that these are distinct subtypes. For example, the Forest Plan includes a description of the montane portion and the subalpine portion of this ecological response unit in the General Description and Background for the Grasslands section. Further recognizing the distinction between these two grassland subtypes, the Forest

Plan also includes a desired condition that addresses the soil structure and water infiltration rates that are characteristic of montane grasslands. See FW-TerrERU-Grass-DC-6.

Like the Forest Plan, the environmental impact statement groups the discussion on these two subtypes together, but provides information specific to one subtype or the other as appropriate. The unique features of the montane and subalpine grassland subtypes are discussed in the Affected Environment for the Vegetation and Fire section in chapter 3 of the environmental impact statement. Likewise, where appropriate, the environmental impact statement describes where there are differences between these subtypes in condition and effects. For example, the environmental impact statement reports that montane grasslands currently has a high departure from desired conditions for soil condition/productivity while subalpine grasslands have a low departure from desired conditions. See the Soils section in chapter 3 of the Final Environmental Impact Statement.

Concern Statement #748: The Forest Service should include avalanche abatement as a risk factor for the Alpine Tundra Ecological Response Unit. (56-201)

Response: In response to this comment, the General Description and Background for the Alpine Tundra ERU section has been adjusted in the Forest Plan.

Concern Statement #759: The Forest Service should not describe the reference condition of ponderosa pine as having low severity fire. Research suggests that large portions of the ponderosa pine forest in northern Arizona were characterized by mixed severity fire, with significant amounts of weather-driven, high-severity fire. (56-36)

Response: No change was made in response to this comment. In the environmental impact statement, reference conditions for ponderosa pine are characterized as primarily open, all-aged forests with a widespread herbaceous understory. Its composition and structure was maintained by frequent, low-intensity fires and endemic levels of insects and disease.

Ponderosa pine is classified as fire regime I, which is defined as a 0- to 35-year fire frequency with low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced) fires. The 2009 Ecological Sustainability Report supported this range of fire frequencies with numerous references (USDA Forest Service 2009a). Research has shown the fire regime in southwestern ponderosa pine had a frequent fire return interval of low-intensity and low-severity surface fire (Fulé et al. (1997), Fulé et al. (2003), Swetnam (1990), Swetnam and Baison (1996), Swetnam et al. (1999), Van Horne and Fulé (2006)). It is also supported by a 110-page General Technical Report on an assessment of forest ecosystem health in the Southwest, and an 85-page report by the Nature Conservancy (Smith 2006).

Within Fire Regime I, up to 25 percent of fire in ponderosa pine could be high severity (stand replacement). This recognizes that fire severity can be variable and that mixed- to high-severity fire can be an aspect of ponderosa pine; however, surface fires were most common. This 25 percent is within the range of the 15 to 65 percent (but not at the high end of range) high-severity fire referred to by the commenters.

The fire severity discussion within Odion et al. (2014) combines ponderosa pine and mixed confer forests as though they were one forest type. Mixed conifer forests do indeed experience mixed-severity fires and ponderosa pine primarily experiences low-severity fire. So, it is not surprising that when considered in combination and across a vast geographic area (where regional differences occur), fire severity would exhibit the variability described in the comment. However, the comment is specifically about ponderosa pine forests and the Forest Plan is specific to the Coconino NF, so the citation is inappropriately broad and not specific enough be relevant.

The commenters reference several articles that support their assertion that mixed-severity fires, with significant amounts of wind-driven high-severity fires were characteristic of ponderosa pine (Odion et al. 2014, Odion and Hanson 2006, Williams and Baker 2012). Much of the current science disagrees with Williams and Baker. Their article was refuted by Fulé et al. (2013). Fulé et al. has 18 co-authors, including many leading researchers in fire ecology in the Southwest. Fulé et al. (2013) describe errors in the Williams and Baker 2012 study related to their use of tree size distributions to reconstruct past fire severity and extent and the use of a qualitatively different fire severity classification.

Concern Statement #767: The Forest Service should consider how aggressive treatments in mixed conifer forest, particularly at relatively mesic locations (e.g., north aspects and riparian zones – wet mixed conifer forest) could degrade Mexican spotted owl habitat and hamper recovery of this species. (56-59)

Response: No change has been made to the Forest Plan in response to this comment. The Forest Plan is programmatic in nature and does not make decisions on specific mechanical treatment techniques to be used in specific situations. Furthermore, the Forest Plan does not include any objectives to conduct vegetation treatments in Mixed Conifer with Infrequent Fire ERU. While this does not mean that no vegetation treatments will occur in this ERU, it does demonstrate that the Forest is not emphasizing treatment in this ERU over the life of the Forest Plan. With regard to vegetation treatments in general, a management approach in the All Terrestrial ERU section reminds forest managers:

> Fire is essential for ecosystem function and for maintaining or moving toward desired conditions in ecosystems where fire is the primary natural disturbance. Primary natural disturbances in Desert Communities, Alpine Tundra, and riparian areas do not include fire, but rather include flooding, precipitation, temperature, wind, avalanches, and ultraviolet radiation. When used as a tool, fire can effectively restore forest structure when used alone or when combined with mechanical treatments. Mechanical treatments may be costly, so the capacity to implement such treatments across the landscape may be limited. Strategic placement and design of mechanical treatments increases their effectiveness in protecting values at risk.

However, decisions to treat, and how to treat, mixed conifer with infrequent fire will be based on site-specific analysis and made at the project level. The effects of a proposed treatment would be analyzed in the project-level environmental analysis.

The Forest Plan provides the framework for projects to select the most effective treatment (mechanical, prescribed fire, or a combination of the two) to move toward desired conditions for the various ERUs. This framework provides direction for more than just vegetation. Treatments in mixed conifer would also be guided by direction in the Wildlife, Fish, and Plants section. For example, the Wildlife, Fish, and Plants section includes a desired condition for habitat conditions to contribute to the survival and recovery of listed species, allow for repatriation of extirpated species, and contribute to the delisting of species under the Endangered Species Act. See FW-WFP-DC-2. Another desired condition in this section addresses the composition, structure and function of ERUs and associated physical elements (e.g., canyons, cliffs, caves, karst, talus slopes, rock piles, specific soil types, springs, wet areas, and other special features) and seeks to provide functioning habitat and refugia to support populations of federally listed species. See FW-WFP-DC-5. A Wildlife, Fish, and Plants guideline requires habitat management objectives and species protection measures from approved recovery plans to be applied to activities occurring within federally listed species' habitat to promote recovery of the species. See FW-WFP-G-1. Another guideline requires the use of fire suppression techniques that minimize habitat and disturbance impacts where there are federally listed and Southwestern Region sensitive species, consistent with public and firefighter safety. See FW-WFP-G-9. Furthermore, direction for all riparian areas provides direction for properly functioning riparian ecosystems and corridors, stabilization and protection of riparian areas,

maintenance of habitat and ecological functions, and establishment of aquatic management zones to protect water quality and avoid detrimental changes. See FW-Rip-All-DC-1, 2, 3, and 5; and FW-Rip-All-G-2 and 3.

Considered together, the direction in the Forest Plan ensures that vegetation treatments conducted in mixed conifer forests will be designed to account for and protect Mexican spotted owl habitat and promote the recovery of the species.

Concern Statement #773: The Forest Service should review the information at http://www.pinenut.com/growing-pine-nuts/pinon-pinyon-chaining.shtml that suggests that it is inappropriate to manage pinyon pine as an invasive species. (24-1)

Response: The information the commenter referred to has been reviewed. While interesting, it is not applicable to decisions being made in the Forest Plan. The Forest Plan recognizes pinyon pine as a native species and provides desired conditions to manage it within its historic range of variability.

The Forest Plan includes objectives to improve or restore various acreages of grasslands on the Forest. These objectives could result in mechanical or prescribed fire treatments that involve the removal of pinyon pine from areas that were historically grasslands. The purpose of these treatments would be to address conditions that are the result of interrupted fire intervals due to human intervention. One of these conditions may involve pinyon pine encroaching into a grassland because the natural fire interval has been interrupted.

Watershed

Concern Statement #16: Desired conditions in the Watershed section of the revised plan should be modified to only reflect that watersheds provide habitat for animal and plant communities. The portion of the desired condition that refers to natural processes should be removed because natural processes are already covered in the first desired condition. (86-1)

Response: As part of an effort to better integrate plan direction, this sentence was removed from the Watersheds desired conditions and direction associated with habitat was merged into one of the Wildlife, Fish, and Plants desired conditions. See FW-WFP-DC-1. Direction on the natural processes associated with watersheds is retained in FW-Water-DC-2.

Concern Statement #17: The Forest Service should provide more focused plan direction on watersheds that provide water to the Inner Basin, Upper and Lower Lake Mary, and the C.C. Cragin Reservoir. (78-1, 82-1, 82-2, 82-13, 82-20, 100-1, 100-2, 100-3)

Response: The Forest Plan has been adjusted in response to these comments. Separate management areas have been identified for the Inner Basin, C.C. Cragin watersheds and the Lake Mary watersheds. These management areas include sections on General Description and Background, Desired Conditions, Guidelines, and Management Approaches that expand on forestwide guidance and complement this unique management scenario. Desired conditions promote a low risk of substantial damage from uncharacteristic fire and recreation to water supply, infrastructure, and water quality. See MA-InBsn-DC-4; MA-LkMary-DC-1; and MA-CCCrg-DC-1. Guidelines in the Lake Mary Watersheds and C.C. Cragin Watersheds Management Areas would reduce the threat of uncharacteristic wildfires, flooding, and sedimentation to maintain water quality and quantity, and would maintain roads and trails to prevent erosion and sedimentation and to protect existing infrastructure. See MA-LkMary-G-1 and 2, and MA-CCCrg-G-1 and 2. Guidelines in the Inner Basin Management Area would also maintain roads and trails to prevent erosion and sedimentation and to protect existing infrastructure and limit dispersed recreation to day-use traffic, by foot or bicycle, to maintain water quality and watershed function. See MA-InBsn-G-4 and 7.

In addition, a desired condition in Wildland-urban Interface would protect property and reduce fire hazard, intensity, and severity to water supply and infrastructure. See FW-WUI-DC-2.

A Management Approach for the Lake Mary Watersheds Management Area recommends continuing collaboration with the Lake Mary Technical Advisory Group for the purpose of protecting and improving water quality and quantity in the domestic water supply and the downstream Walnut Creek riparian area. Another Management Approach for this management area recommends cooperation with the City of Flagstaff and National Park Service to develop study proposals and projects designed to evaluate best management practices, reservoir modifications, and/or operational criteria to address the objectives of maintaining the quality of the water supply and increasing the likelihood of flood flows and improvement of the inner-canyon environment in Walnut Canyon National Monument (per the Stipulation Between The City of Flagstaff and the United States on Behalf of the National Park Service and the Forest Service).

A management approach in the C.C. Cragin Watersheds Management Area recommends coordination with the Salt River Project, National Forest Foundation, Town of Payson, the Bureau of Reclamation, U.S. Fish and Wildlife Service, Arizona Game and Fish Department, Arizona Elk Society, the local community, and other stakeholders to proactively improve the health and resiliency of the C.C. Cragin Watersheds Management Area.

Concern Statement #42: In the revised plan, the Forest Service should provide information as to how the numbers of watersheds (or other resources) to be improved that were included in the objective in the Watersheds section (see Draft Revised Plan FW-Wtrshd-O-1) were chosen and provide information on how the objective is specific, measurable, attainable/achievable, relevant, and timely. (86-4, 86-5)

Response: As discussed in chapter 1 of the Forest Plan, activities specified in objectives are intended to help make progress toward achieving desired conditions and represent just some of the outcomes or actions expected to accomplish movement toward desired conditions. Objectives are projections based on recent trends, current and anticipated staffing levels, and anticipated budgets. Objectives represent an anticipated and realistic program of work and were developed through conversations with program managers, staff officers, and decision makers on the Forest. For the objective in question, improving five to seven 6th code watersheds was selected because it was anticipated that foreseeable projects on the Forest like the Four Forest Restoration Initiative would lead to restoration activities that would improve that number of watersheds. In other words, the Watershed objective did not envision discrete and distinct watershed restoration projects whose sole purpose was to achieve this objective. Rather, this objective was relying upon other anticipated activities that would be conducted to pursue other objectives, such as the objectives associated with the Ponderosa Pine ERU. Because the Watershed objective was determined to be redundant of other plan objectives, this objective was removed from the Forest Plan. The intent of emphasizing priority 6th code watersheds, however, is still carried forward in the Forest Plan in FW-Water-G-2.

Concern Statement #51: The Springs desired condition (see Draft Revised Plan FW-Aq-Spr-DC-2) should be adjusted to remove the terms "historic levels" and "healthy." Historic levels may not be realistic in the face of recurring droughts and springs would be healthy if the necessary soil, water, and vegetation attributes are functioning at or near potential. (86-18)

Response: The desired condition has been adjusted to address your comments. The word "healthy" is no longer being used as a description of condition. The reference to "historic levels" has also been removed. See FW-Rip-Spr-DC-1.

Concern Statement #56: The Forest Service should arrange desired conditions for resources, such as Watersheds, by scale, as was done in the Vegetation section of the plan. (44-1)

Response: Having plan direction by scale can be useful. Forest Plan direction has direction by scales when there is sufficient information to do so or when the topic lends itself to that arrangement. Watersheds are an example of a resource in which using scales is challenging. Even though watersheds are divided and sub-divided by hydrological unit code (HUCs) nationally, the direction in the Watershed and Water section applies to all scales regardless of size unless indicated otherwise. Different aspects of watersheds are listed individually (Stream Ecosystems, Riparian Areas, Riparian Forest Types) as are individual ERUs. Collectively, the direction in each one of these sections would guide management in watersheds.

Concern Statement #57: The Forest Plan should explain how desired conditions in the Watershed section will result in improvement in watershed conditions in light of the persistence of less than desired conditions and insufficient funding to address underlying issues. (74-65)

Response: The desired conditions for watersheds, like the desired conditions for all other resources, will guide how activities and uses authorized under the Forest Plan are designed and authorized. Desired conditions are aspirational and it is acknowledged that they may only be achievable over a long time frame. There is no specific date by which they are to be achieved. The assumption is that activities will be approved and projects will get proposed to address a variety of site-specific needs including less than desired conditions on the ground. There is also an assumption that there will be funding to plan and implement some level of projects, although to an unknown extent. Because there is wall-to-wall coverage of watersheds on the Forest, any project will occur within a watershed. All projects need to be consistent with desired conditions for other resources and most vegetation and burning projects could be beneficial for watersheds. The rate of improvement in individual watersheds can be derived from question 18 in the Monitoring Plan in chapter 5 of the Forest Plan, which focuses on priority 6th code watersheds.

However, as described in the Plan Content section in chapter 1 of the Forest Plan, projects and site-specific activities "must be consistent with desired conditions...." The following information has been added to the discussion on desired conditions in the Plan Content section to clarify the ways site-specific projects can demonstrate consistency with desired conditions:

To be consistent with the desired conditions of the plan, a project or activity, when assessed at the appropriate spatial scale described in the plan (e.g., landscape scale), must be designed to meet one or more of the following conditions:

- Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
- Be neutral with regard to progress toward plan desired conditions; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
- Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.

Applying these conditions to project-level decisions will ensure that projects and activities the Forest undertakes will move watersheds in less than desired conditions toward desired conditions or maintain desired conditions in other watersheds. In this manner, as more decisions are made that are consistent with these desired conditions, whether they be projects designed specifically to restore desired conditions in a watershed or unrelated projects that have the potential to impact watersheds, watershed conditions should cumulatively improve.

Concern Statement #59: The Forest Plan should provide direction for developed water sources to be adequately distributed across the landscape and maintained to meet wildlife needs. (75-46)

Response: Several desired conditions and guidelines have been incorporated into the Forest Plan to address your comment. See FW-ConstWat-DC-1 and 2 and FW-ConstWat-G-2. Another desired condition in the Wildlife, Fish, and Plants section recognized the potential necessity of human-made habitats to support wildlife. See FW-WFP-DC-8.

Concern Statement #60: The Forest Plan should adjust the grassland guideline related to making natural waters available to pronghorn to include all water sources (FW-Veg-Grass-All-G-2), not just natural water sources, to be available to pronghorn during the fawning season. (75-64)

Response: The Forest Plan has been adjusted in several ways in response to this comment. First, the concept of "access to natural waters" has been expanded from the grassland types to wherever pronghorn habitat may occur. See FW-WFP-DC-3; FW-WFP-G-6. This concept has also been expanded to include all water sources. FW-ConstWat-DC-2; FW-WFP-G-5; and FW-Graz-G-6.

Concern Statement #61: The Watersheds desired condition that addresses recharge areas for designated and eligible wild and scenic river segments (see Draft Revised Plan FW-Aq-Wat-DC-7) is unnecessarily restrictive and should be broadened to apply to other river segments. (75-47)

Response: This desired condition has been adjusted to incorporate your suggestion; it is no longer restricted to wild and scenic rivers. See FW-Water-DC-5.

Concern Statement #62: The Forest Service should work with the Arizona Game and Fish Department and USFWS to identify ecologically sensitive watersheds. (75-48)

Response: The Forest Service uses the Watershed Condition Framework to identify priority watersheds. The Forest Service coordinates with Arizona Game and Fish Department as part of the Framework process.

Concern Statement #77: The Forest Plan should include standards in the Watersheds and Water, Streams, Wetlands, Constructed Waters, and Springs sections, including standards that may repeat requirements that already exist in law, regulation, and policy, or explain why standards are not needed for water resources. (86-2)

Response: No standards have been added to the Forest Plan in response to this comment. As the commenter suggests, there are laws, regulations, and policies outside of the Forest Plan that provide requirements and guidance related to the management of these resources. However, the Forest Plan generally does not repeat law, regulation, and policy. Direction on these other sources of information is listed in the Watersheds and Water, Constructed Waters, Riparian Areas section in appendix D of the Forest Plan.

While standards have not been added, there are guidelines in the sections on Watersheds and Water, Constructed Waters (which includes reservoirs), All Riparian, Stream Ecosystems, and Riparian Forest Types. As described under Plan Content in chapter 1 of the Forest Plan, guidelines guide management activities and provide specifications that a project or activity would adopt unless there is a compelling or defensible reason to vary from the guideline. The intent of a guideline needs to be met although deviation from the explicit provisions of the guideline is permitted without a plan amendment. Deviation from the explicit provisions of a guideline, if it is meeting the intent of the guideline, must be documented in the project record. Projects that deviate from a guideline's intent must be accompanied by a plan amendment that would allow for the deviation.

Concern Statement #82: The Forest Plan should include direction on drinking water for municipalities in the Watersheds section. (82-12)

Response: The Watersheds and Water section includes a desired condition and a guideline regarding water quality and supporting identified designated beneficial uses. This plan direction strategically addresses drinking water for municipalities and a myriad of other designated beneficial uses that rely upon water quality. See FW-Water-DC-7 and FW-Water-G-5.

Concern Statement #83: The Forest Plan should include a reference to municipal watershed infrastructure in Watershed guideline FW-Wtrshd-G-1. (82-14)

Response: This guideline has been changed to a management approach and was adjusted to incorporate your suggestion. In addition to roads, bridges, and power corridors, water supply has been added to the list of examples of community infrastructure. See the FW-Water-Management Approach which states:

> To enhance the protection of human health and safety, consider watershed treatments such as vegetation thinning, prescribed burning, and channel stabilization where protection of people, structures, and community infrastructure (such as roads, bridges, power corridors, and water supply) in and associated with the wildland-urban interface (WUI) are at risk.

Concern Statement #84: The Forest Plan should seek to retain water quality in watersheds that contain recharge areas for municipal water sources. (82-16)

Response: One of the desired conditions in the Watersheds and Water section has been adjusted to recognize the connection between water quality, water, quantity, and the timing of water flows and water sources for municipalities. See FW-Water-DC-6. A separate desired condition addresses your suggestion that water quality be retained at levels that support designated beneficial uses. See FW-Water-DC-7.

Concern Statement #91: The Forest Plan should include specific watershed and soil direction for the Beaver Creek area. (99-7)

Response: The topics of water volume, turbidity, and soil erosion have been addressed in forestwide direction. See FW-Water-DC-2, 3, 5, 6, and 7 and FW-Water-G-4. See also plan components in the forestwide direction for All Riparian Areas and Stream Ecosystems.

Although a Beaver Creek Management Area has not been identified as part of the Plan, in response to your comments, the Verde Valley Management Area plan components were reviewed, edited, and augmented. For example, a desired condition has been added to the Verde Valley Management Area that guides management of watersheds to reduce the risk of uncharacteristic flooding and sedimentation, including in the Beaver Creek watershed. See MA-VerdeV-DC-1.

Concern Statement #114: The Forest Service should restore the small plant community to improve soil and watershed conditions. (64-52)

Response: The Forest Plan represents one part of the Coconino NF's effort to improve vegetation, soil, and watershed conditions on the Forest. The Forest Plan provides a framework that will guide decisions on projects and activities on the Forest. Projects and activities that are implemented and authorized under the Forest Plan will need to demonstrate consistency and compliance with plan components. Designing projects and activities to be consistent with the desired conditions in the Forest Plan will ensure that management decisions under the plan will maintain or improve the vegetation, soil, and watershed conditions on the Forest.

References to promoting and restoring the small plant community, and the understory, are located in numerous locations in the plan. Some examples include FW-TerrERU-Grass-DC-1, 2, 4, FW-TerrERU-

Grass-G-2; FW-TerrERU-PJ-DC-4; FW-TerrERU-AspMpl-DC-1; FW-TerrERU-PP-DC-10; FW-TerrERU-MC-MCFF-DC-4; and FW-TerrERU-Grass-O-1, 2, and 3.

Concern Statement #364: The Forest Service should adjust the information in the EIS to reflect that the East Clear Creek Watershed is currently being managed under the East Clear Creek Watershed Recovery Strategy and should describe how management would differ under the wildlife habitat management areas proposed in Alternative C. (86-55)

Response: The information in the environmental impact statement has not been adjusted in response to this comment, because some aspects of the East Clear Creek Watershed Recovery Strategy have already been implemented and are considered part of existing condition. For example, site-specific decisions associated with the Buck Springs grazing allotment are reflected in the grazing suitability analysis. See chapter 4 of the revised plan and appendix C in the environmental impact statement. In addition, ongoing activities associated with the strategy would be consistent with the current land management plan as amended and would be common to all alternatives. For most resources, the consequences of alternative C are similar to the consequences of alternative B (modified) except for those features that are unique to alternative C, such as management areas that emphasize human-related disturbance (formerly entitled "Wildlife Habitat Management Areas). These consequences are discussed in chapter 3 of the environmental impact statement and are in addition to ongoing activities. The consequences of alternative C's old growth language are discussed both in alternative B (modified) and alternative A.

Water Resources

Concern Statement #72: The Forest Plan should emphasize healthy watersheds and protection of water supplies through proactive management of these resources. (82-27)

Response: The Forest Plan has been developed to integrate the management of resources on the Forest. Water is recognized as a very valuable resource on the Forest, and there are many plan components that are designed to ensure that forest management and activities on the Forest are conducted in a manner that maintains or improves this resource. In addition, three management areas specifically focus on water supply, the maintenance of water quality, groundwater recharge, and precipitation infiltration, and a low risk of uncharacteristic fire. The management areas are the Inner Basin, Lake Mary Watersheds, and C.C. Cragin Watersheds. See MA-InBsn-DC-1 to 4; MA-LkMary-DC-1; MA-LkMary-G-1, 2; MA-CCCrg-DC-1; and MA-CCCrg-G-1, 2. A management approach in the C.C. Cragin Watersheds Management Area reminds managers to coordinate with the Salt River Project and other stakeholders to improve the health and resiliency of the watersheds. It reads:

> Coordinate with the Salt River Project, National Forest Foundation, Town of Payson, the Bureau of Reclamation, U.S. Fish and Wildlife Service, Arizona Game and Fish Department, Arizona Elk Society, the local community, and other stakeholders to proactively improve the health and resiliency of the C.C. Cragin Watersheds Management Area.

Concern Statement #66: The Plan should manage riparian ecosystems for ecological function and integrity and to support the recovery of fish and wildlife species. (56-15, 84-41)

Response: The Forest Plan has numerous desired conditions that relate to the ecological integrity and function of riparian areas, stream banks, flow regimes, and other features of aquatic habitat. See FW-Eco-DC-3; FW-Water-DC-1 to 7; FW-Rip-All-DC-1 to 5; FW-Rip-Strm-DC-1 to 4; FW-Rip-Wtlnds-DC-1, 2; FW-Rip-Spr-DC-1 to 5; FW-Rip-RipType-DC-1 to 6; and FW-WFP-DC-4, 5, 6.

Guidelines that specifically apply to functioning aquatic and riparian ecosystems include: FW-Water-G-1 to 6; FW-Rip-All-G-2; FW-Rip-Strm-G-1; FW-Rip-Spr-G-1 to 4; FW-Rip-RipType-G-1; FW-WFP-G-3; and FW-RdsFac-G-5 and 9.

In addition, there are objectives in the plan to restore wetlands, springs, non-functioning and function-at-risk riparian areas, and stream habitat. See FW-Rip-Wtlnds-O-1; FW-Rip-Spr-O-1, FW-Rip-RipType-O-1, and FW-WFP-O-4.

In regards to areas near the edge of perennial water, an aquatic management zone is required to protect water quality and to avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. As a general starting point, the zone width in riparian areas ranges from 100 to 150 feet on each side of the streamcourse or riparian area depending on erosion hazard (See FW-RipAll-G-3). A management approach for All Riparian Areas recommends project-level analysis to determine whether the zone should be wider or narrower. It reads:

> Consider Table 1 as a general starting point for determining the width of the aquatic management zone relative to erosion hazard. Aquatic management zones may be wider or narrow than suggested in Table 1 and would be decided at the project level. Considerations for the size and shape of an aquatic management zone include amount and type of material on the ground, width and slope of the zone, soil type or hydrologic soil group, orientation of stream or river to the Sun, connection of stream to impaired or non-attaining waters, presence of threatened or endangered species, condition of the riparian area, adjacent land use, and threat of contamination from pollutants or chemicals. Significant topographic changes, such as abrupt canyon edges may be used as boundaries for aquatic management zones, as long as activities beyond the canyon walls do not negatively influence the functioning of the aquatic management zone.

Because non-riparian streamcourses could also negatively affect perennial waters, an aquatic management zone is also required for non-riparian, intermittent streamcourses to reduce sedimentation, maintain functioning of the channel within its floodplain, and maintain downstream water quality and riparian habitat and function. This management zone would also avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. See FW-Rip-Strm-G-2. Stream Ecosystems has a management approach similar to the one in All Riparian Areas, but in addition, it mentions consideration of ephemeral streamcourses that might influence downstream water quality. In addition, a site-specific aquatic management zone would be required for new projects and management activities around reservoirs to protect water quality and to avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions or aquatic habitat. See FW-ConstWat-G-1.

Also, desired conditions in Wildlife, Fish and Plants support properly functioning ecosystems, which in turn support sustainable populations of native plant and animal species distributed throughout their potential natural range, and the recovery of listed species, and these conditions maintain species diversity and metapopulations. See FW-WFP-DC-1 and 2.

Concern Statement #26: The Forest Plan should specifically address the use of reclaimed water on the Forest. Those plan components should apply to existing authorizations for snowmaking at the Arizona Snowbowl, as well as new decisions. (50-3, 56-29, 56-45, 56-91, 84-60, 103-1)

Response: The Forest Plan includes plan components that will guide new decisions on projects and activities that consider the use of reclaimed water on the Forest. For example, the revised Forest Plan includes desired conditions for watersheds to be functioning properly and to exhibit high geomorphic, hydrologic, and biotic integrity within their inherent capability. See FW-Water-DC-1 and 2. A desired condition for the Alpine Tundra ERU seeks to maintain the attributes and processes that contribute to the ecological diversity and habitat for native biota in the ERU. See FW-TerrERU-AT-DC-1. Decisions on

where and when to allow the use of reclaimed water are made at the project level based on site-specific information. New decisions on the use of reclaimed water will need to be consistent with these desired conditions and all of the other guidance in the Forest Plan.

Past decisions are outside the scope of the Forest Plan. The effects of the existing authorization for the Arizona Snowbowl to conduct snowmaking with reclaimed water on alpine tundra and the species and cultural values associated with alpine tundra were analyzed in the decision to authorize that use of reclaimed water and snowmaking.

Concern Statement #27: The Forest Plan should include direction describing how the Forest will pursue and manage water rights. (56-31, 74-60, 74-62, 84-62, 86-11)

Response: The language relating to maintenance and procurement of instream water rights has been adjusted in the Water section in response to your suggestion. Maintenance of existing water rights is addressed in FW-Water-DC-6, which states:

> Water quality, water quantity and the timing of water flows support ecological functions, habitat for aquatic and riparian species, and water sources for municipalities. Water quality, water quantity, and the timing of flows are sustained at levels that retain the biological, physical, and chemical integrity of associated systems and benefit survival, growth, reproduction, and migration of native species.

Procurement of instream water rights is addressed in FW-Water-G-3, which states:

> Instream flow water rights should be procured for those streams without instream water rights to ensure that sufficient flow is provided for aquatic species, habitat, and recreation.

In addition to FW-Water-G-3, there are multiple management approaches in the Water section that identify priorities and expectations for the Water program in the future. These management approaches remind forest managers to:

> File for water rights on appropriable waters following State procedures. Complete all documentation required for the adjudication process in the Little Colorado and Gila River (Verde watershed) specified by the courts.
>
> Prioritize streams for water right filing based on risk of diversion and subsequent onsite loss of water, and habitat for threatened and endangered aquatic species. Complete required stream gaging and file applications on priority streams. Gaging, filing, and any associated adjudication are completed as budgets allow.
>
> Participate in State water rights adjudications and settlement discussions for negotiating water rights settlements outside of extended adjudication.
>
> Secure water rights through purchase or severance and transfer when additional sources are needed.
>
> Consider water rights during project planning and implementation.
>
> Maintain and annually update an inventory of all water rights on the forest.

Concern Statement #28: The Forest Plan should include additional plan direction to protect riparian areas and soil and water resources as required by the National Forest Management Act, the agency's planning regulations at 36 CFR 219.27 (e) and (f), the Endangered Species Act, and the National Environmental Policy Act. Furthermore, the Forest Plan should retain the following standards and guidelines from the 1987 plan:

Manage riparian areas to protect the productivity and diversity of riparian-dependent resources by requiring actions within or affecting riparian areas to protect and, where applicable, improve dependent resources. Emphasize protection of soil, water, vegetation, and wildlife and fish resources prior to implementing projects.

Give preferential consideration to resources dependent on riparian areas over other resources. Other resource uses and activities may occur to the extent that they support or do not adversely affect riparian-dependent resources.

(74-66, 84-40)

Response: The Forest Plan contains direction related to riparian areas, water, watersheds and riparian dependent and aquatic species as required by the National Forest Management Act and the agency's planning regulations for forest plans prepared under the 1982 Planning Rule found at 36 CFR 219.27 (e) and (f). While there are no plan standards for riparian areas or soil and water, there are numerous desired conditions, objectives, and guidelines in a variety of places in the Forest Plan that are intended to maintain or improve riparian and aquatic habitats, and soil and water resources. Plan direction for riparian areas, which include stream ecosystems, wetlands, springs, and riparian forest types, is included in the Riparian Areas section. While there are no standards for management of riparian areas, the plan direction in the Riparian Areas section provides comprehensive direction for these areas. Plan objectives in Wetlands, Springs, Wildlife, Fish and Plants would also lead to improvement in riparian areas and streams. See FW-Rip-Wtlnds-O-1, FW-Rip-Spr-O-1, FW-Rip-RipType-O-1, and FW-WFP-O-4.

Soil and water guidelines would implement and monitor best management practices for all activities with the potential to impair water quality to control and manage nonpoint source pollution and to maintain water quality, quantity, and timing of flows, and to prevent or reduce accelerated erosion. See FW-Soil-G-1 and FW-Water-G-4. Buffers, called aquatic management zones, would be identified and maintained in riparian areas to avoid detrimental changes that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. See FW-Rip-All-G-3. Aquatic management zones would also be established in non-riparian, intermittent streamcourses to maintain channel functioning, downstream water quality, riparian habitat, and function. See FW-Rip-Strm-G-2.

Some of the desired conditions and guidelines that promote resiliency, hydrologic and biotic integrity, natural processes, base flow, riparian communities, groundwater recharge, and species diversity include FW-Water-DC-1, 2, 3, 5, 6, 7; FW-Water-G-3, 6; FW-Rip-All-DC-1, 2, 5, FW-Rip-Strm-DC-1 to 4; FW-Rip-Strm-G-1; FW-Rip-Wtlnds-DC-1, 2; FW-Rip-Spr-DC-1 to 5; FW-Rip-Spr-G-1, 3, 4; FW-Rip-RipType-DC-1, 2, 4, 5, 6; FW-Rip-RipType-G-1, 3, 4; FW-WFP-DC-3, 4, 5; FW-Invas-DC-1, 2; FW-Invas-G-1, 2; FW-Graz-G-4, 5, 7; FW-RdsFac-G-5, 9, FW-Rec-All-G-2, and FW-Rec-Disp-G-5.

Connectivity along streams, across floodplains and valley bottoms, between surface and subsurface flows, and between vegetative communities is supported by desired conditions in Watersheds and Water, All Riparian Areas, Riparian Forest Types, and Wildlife, Fish and Plants. See FW-Water-DC-4; FW-Rip-All-DC-3; FW-Rip-All-G-2; FW-Rip-RipType-G-2; and FW-WFP-DC-6.

Additional direction related to the management of riparian areas and soil and water resources is included in law, regulation, and policy. In general, because existing law, regulation, and policy already articulates additional guidance related to riparian areas and soil and water resources that the Forest must comply with, the direction from those authorities is not repeated in the Forest Plan. However, as a reminder of these other obligations, appendix D in the Forest Plan lists many of these other authorities. For example, references to FSM 2880 and FSM 2540 are included in the Watersheds and Water, Constructed Waters, Riparian Areas section in appendix D of the Forest Plan.

This forest plan revision effort and preparation of the environmental impact statement have been conducted in compliance with the National Environmental Policy Act. Furthermore, the Act does not require the inclusion of any particular plan direction to protect riparian areas and soil and water resources.

The standards and guidelines referred to in the concern statement do not appear in the Coconino NF 1987 forest plan, and therefore, could not be retained as suggested.

Concern Statement #29: The Forest Plan should include appropriate standards and other planning tools that adequately protect riparian zones, including considering many of the issues and planning tools described in alternative D of the environmental impact statement associated with the 2012 planning rule. (74-67)

Response: The Final Rule and Record of Decision for the 2012 Planning Rule provides a detailed description explaining why alternative D in the Programmatic Environment Impact Statement was not selected. Among those reasons were the high cost of planning and monitoring associated with the alternative and the recognition that some of the direction would not be appropriate to all National Forest System units. 77 Fed. Reg. 21,162 (April 9, 2012) The Final Rule and Record of Decision disclosed that Modified Alternative A from the Programmatic Environment Impact Statement was used to promulgate the land management planning regulations for the 2012 Planning Rule. The Coconino NF's forest plan revision effort is being conducted under the 1982 Planning Rule. Accordingly, the Forest is not required to prepare the Forest Plan to comply with an alternative that was not selected for a planning rule that does not apply.

Nonetheless, the revised Forest Plan includes plan components that protect watersheds and riparian areas. See plan direction in the Watersheds and Water and Riparian Areas sections. For example, while the revised Forest Plan may not require the establishment of "riparian conservation areas" as discussed in alternative D in the Programmatic Environment Impact Statement for the 2012 Planning Rule, it does include guidelines to identify and maintain aquatic management zones. Aquatic management zones are buffers for all riparian areas and for non-riparian, intermittent streamcourses, to reduce sedimentation, maintain channel functioning within its floodplain, and maintain downstream water quality and riparian habitat and function. See-Rip-All-G-3 and FW-Rip-Strm-G-2. In addition, soil and water guidelines would implement and monitor best management practices for all activities with the potential to impair water quality, to control and manage nonpoint source pollution, and to maintain water quality, quantity, and timing of flows, and to prevent or reduce accelerated erosion. See FW-Soil-G-1 and FW-Water-G-4. The Forest Plan does not identify key watersheds such as in alternative D in the Programmatic Environment Impact Statement for the 2012 Planning Rule, but it has a guideline to focus watershed restoration and maintenance, and vegetation treatment on priority 6th code watersheds to ensure that ecosystem processes, resilient vegetation conditions, and natural disturbance regimes are functioning properly. See FW-Water-G-2.

Spatial connectivity between upland and aquatic habitats is promoted in the Forest Plan, similar to alternative D in the Programmatic Environment Impact Statement for the 2012 Planning Rule. Connectivity along streams, across floodplains and valley bottoms, between surface and subsurface flows, and between vegetative communities and upland and aquatic habitats is supported by desired conditions in Watersheds and Water, All Riparian Areas, Riparian Forest Types, and Wildlife, Fish and Plants. See FW-Water-DC-4; FW-Rip-All-DC-3; FW-Rip-All-G-2; FW-Rip-RipType-G-2; and FW-WFP-DC-6.

Other desired conditions and guidelines in the Forest Plan promote resiliency, hydrologic and biotic integrity, natural processes, base flow, riparian communities, groundwater recharge, and species diversity. These plan components include FW-Water-DC-1, 2, 3, 5, 6, 7; FW-Water-G-3, 6; FW-Rip-All-DC-1, 2, 5; FW-Rip-Strm-DC-1, 2, 3, 4; FW-Rip-Strm-G-1; FW-Rip-Wtlnds-DC-1, 2; FW-Rip-Spr-DC-1, 2, 3, 4, 5;

and FW-Rip-Spr-G-1, 3, 4; FW-Rip-RipType-DC-1, 2, 4, 5, 6; and FW-Rip-RipType-G-1, 3, 4; FW-WFP-DC-3, 4, 5; FW-Invas-DC-1, 2; FW-Invas-G-1, 2; FW-Graz-G-4, 5, 7; FW-RdsFac-G-5, 9, FW-Rec-All-G-2; and FW-Rec-Disp-G-5.

The Forest Plan includes a Monitoring Plan in chapter 5 that was developed to meet the requirements of the National Forest Management Act and the 1982 Planning Rule. To monitor riparian areas on the Coconino NF, the Monitoring Plan includes the following questions:

> Question #8: How much have management activities improved functional-at-risk or nonfunctional stream riparian areas and wetlands?
>
> Question #9: How much have management activities contributed to the restoration of riparian function to springs not in proper functioning condition?

In addition to these specific questions on riparian conditions, the information included in the evaluation reports prepared under the Monitoring Plan would be evaluated to determine if any changes are needed in management actions or the plan itself. These evaluations would ask if there have been any unanticipated changes in condition, if those changes attributable to climate change, and if modifications were needed to account for the changed conditions. See Introduction to Monitoring Strategy in chapter 5 of the Forest Plan. Individual projects would also conduct additional monitoring. The monitoring needs for those projects would be determined based on the type of project and the resources involved.

Concern Statement #32: The Forest Plan should recognized the link between forest health and water supply. This should be clearer in the All Vegetation Types section and in FW-Wtrshd-G-1.(78-5)

Response: A desired condition in the Watersheds and Water section has been adjusted to incorporate this suggestion. The adjusted desired condition acknowledges that vegetation and soil conditions in watersheds support important ecosystem services such as clean water, base flow, riparian communities, and long-term soil productivity. See FW-Water-DC-3. After reviewing the Watersheds and Water guideline, it was determined that it would be more appropriate to change it to a management approach. "Water supply" was added to the examples of community infrastructure listed in the management approach. The management approach states:

> To enhance the protection of human health and safety, consider watershed treatments such as vegetation thinning, prescribed burning, and channel stabilization where protection of people, structures, and community infrastructure (such as roads, bridges, power corridors, and water supply) in and associated with the wildland-urban interface (WUI) are at risk.

"Water supply" is also included in the Wildland-urban Interface section as one of the categories in which reduced fire hazard, intensity, and severity would be promoted. See FW-WUI-DC-2.

Concern Statement #33: The Plan should require buffer zones to protect riparian areas. (80-17, 84-100)

Response: The Forest Plan includes direction to identify and maintain buffers, called aquatic management zones, in riparian areas (perennial and intermittent streamcourses, lakes, wetlands, and springs and their associated riparian vegetation zone) to avoid detrimental changes that would seriously and adversely affect water conditions, fish habitat, or connected downstream cave, karst, and lava tube resources. See FW-Rip-All-G-3. Aquatic management zones would also be established in non-riparian, intermittent streamcourses to maintain channel functioning, downstream water quality, riparian habitat, and function. See FW-Rip-Strm-G-2. In addition, aquatic management zones would be identified and maintained for new projects and management activities around reservoirs to protect water quality and to

avoid detrimental changes in water temperature or chemical composition, blockages of streamcourses, or sediment deposits that would seriously and adversely affect water conditions or aquatic habitat. See FW-ConstWat-G-1.

Aquatic management zones generally follow the shape of the streamcourse or riparian area, consider topography and climate, and consist of vegetation and vegetative litter. General starting points for aquatic management zones in riparian areas range from 100 to 150 feet each side of the streamcourse or riparian area depending on whether the erosion hazard is considered slight, moderate, or severe. General starting points for aquatic management zones in non-riparian intermittent streamcourses range from 35 to 100 feet each side of the streamcourse, depending on the erosion hazard.

Concern Statement #35: The Forest Service should not manage reservoirs in the same manner as wetlands. (85-5, 86-6, 86-16)

Response: In response to your comment, reservoirs have been moved to a new section of the Forest Plan that provides guidance for Constructed Waters. See plan components in the FW-ConstWat section for direction on reservoirs and other constructed waters.

Concern Statement #8: The Forest Plan should declare snowmaking as an incompatible use on the Forest to protect the limited water resources in this region, the federally listed endangered San Francisco Peaks Ragwort, and the San Francisco Peaks Traditional Cultural Property. (5-8, 14-2, 56-198, 103-3)

Response: The Forest Plan does not expressly declare snowmaking as an incompatible use on the Forest. However, the Forest Plan does contain several components that provide a framework that can be applied to protect the limited water resources in this region, the federally listed endangered San Francisco Peaks Ragwort, and the San Francisco Peaks Traditional Cultural Property.

The Watersheds and Water section includes desired conditions to sustain water quantity (base flows) of intermittent and perennial streams within the historic range of variability. See FW-Water-DC-5. Water quality and water quantity is desired to be at levels that support ecological functions; habitat for aquatic and riparian species; and water sources for municipalities, and, at levels that retain the biological, physical, and chemical integrity of associated systems and benefit survival, growth, reproduction, and migration of native species. See FW-Water-DC-6. Finally, it is a desired condition for water quality to meet or exceed Arizona water quality standards and support identified designated beneficial uses. See FW-Water-DC-7. To be consistent with the Forest Plan, a proposed activity must be consistent with these desired conditions or a forest plan amendment would be required to authorize the activity.

The Forest Plan includes a desired condition for habitat conditions to contribute to the survival and recovery of listed species and contribute to the delisting of species under the Endangered Species Act. See FW-WFP-DC-2. As with the concerns with water quantity and quality, a proposed activity must be consistent with this desired condition or a forest plan amendment would be required to authorize the activity.

The Forest Plan also includes a desired condition for traditional cultural properties to be preserved and protected for their cultural importance. See FW-Hrtg-DC-1. As with the concerns with water quantity and quality and endangered species, a proposed activity must be consistent with this desired condition or a forest plan amendment would be required to authorize the activity.

Accordingly, the strategic approach used by the Forest Plan provides guidance relevant to the concerns expressed in these comments without being overly prescriptive and dismissing an activity without considering it at the project level where site-specific information can inform the decision."

Concern Statement #18: In the revised plan, the Forest Service should modify the General Description and Background for springs to clarify that springs are often used simultaneously by livestock, by wildlife, and for domestic use, and to list snails, plants, and invertebrates as examples of endemic species. (85-11)

Response: The General Description and Background for Springs has been edited to incorporate your suggestions.

Concern Statement #19: In the revised plan, the Forest Service should adjust the desired condition for vegetation in the section on Springs to clarify that vegetation can vary depending on site factors such as slope, aspect, and solarization. (85-12)

Response: The Springs desired condition has been edited to incorporate your suggestions. See FW-Rip-Spr-DC-2.

Concern Statement #20: In the revised plan, the Forest Service should revise the footnote associated with plan objectives in the section on Springs to read: "Where there is a structure in place to utilize water from a spring as a water source, the spring and any immediate associated riparian habitat should be protected, by fencing if necessary, and water should be piped out of the riparian area to avoid trampling of the riparian area around the spring." (85-13)

Response: The language in the footnote in the Springs objective (see FW-Rip-Spr-O-1) has been edited to incorporate your suggestions and incorporated into FW-Rip-Spr-G-4.

Concern Statement #21: The Forest Service should provide additional detail on how to construct fences that reduce impacts to wildlife. (85-14)

Response: The language in the Springs guideline has been edited to incorporate your suggestions. And, the guideline was moved to the Wildlife, Fish, and Plants section (see FW-WFP-G-5), where it addresses all structural improvements that could impact wildlife, not just structural improvements associated with springs.

Concern Statement #24: In the revised plan, the Forest Service should clarify what the phrase "do not significantly impact" means in a guideline intended to minimize recreational impacts in riparian areas. There is no quantitative measure or standard for what is "significant." The guideline should be written to say no or minimal impact instead. (85-26)

Response: The language in the Riparian Forest Type guideline has been adjusted in response to your suggestion. The revised guideline has been moved to the Riparian Forest Types subsection of the Riparian Areas section of the plan. See FW-Rip-RipType-G-3.

Concern Statement #36: In the revised plan, the Forest Service should adjust the General Description and Background for wetlands to clarify that wetlands are often (rather than the term 'generally') disconnected from groundwater. The term "ephemeral wetlands" might be more accurate to describe sites like Allan Lake, the Anderson Mesa wetlands, and Roger's and Duck lakes. (85-6)

Response: The General Description and Background for the Wetlands section has been adjusted to acknowledge that these areas are inundated by surface or ground water. Cienegas are identified as a type of spring and are addressed in the Springs section.

Concern Statement #37: In the revised plan, the Forest Service should adjust the General Description and Background for wetlands to clarify that the greatest threat and direct cause of wetland loss is the channelization and draining of wetlands as well as the lowering of water tables

by stream down-cutting and incision. These are greater threats than the disturbances listed in the draft plan: grazing, road-building, and stock tank construction. (85-7)

Response: The General Description and Background for the Wetlands section has been adjusted to incorporate your comment regarding channelization and lowering of water tables.

Concern Statement #38: In the revised plan, the Forest Service should modify the livestock watering portion of the first desired condition in the section on Wetlands. The sentence that states "Wetlands provide water storage, wildlife habitat, recreation, fisheries, and livestock watering" should be modified to read "….and water for livestock grazing" so there is greater consistency with desired conditions in the revised plan and regional and national Forest direction and policy. (85-8)

Response: The reference to "livestock watering" in the General Description and Background for the Wetlands section has been removed.

Concern Statement #39: The Forest Plan should use a generally accepted definition of cienega, such as the one developed by Mitsch and Gosselink 2007. Another acceptable option would be to include the definition used in the Kaibab National Forest Plan: "The wetland/cienega vegetation communities are associated with perennial springs or headwater streams where groundwater intersects the surface and creates pools of standing water, sometimes with channels flowing between pools." (85-9)

Response: In response to the comment, cienega has been added to the Glossary for the Forest Plan, which defines cienegas as spring-fed wet meadows and cienega is included in the General Description and Background for Springs as a spring type. This is consistent with Stevens and Meretsky (2008). Plan components for cienegas have been moved from the Wetlands section to the Springs section. The General Description and Background for Springs describes springs as "surface-linked ecosystems where ground water reaches and usually flows from the earth's surface in complex, and sometimes lengthy, flow paths through subsurface structural, geochemical, and geomorphic environments" (from Stevens and Meretsky 2008) and includes cienegas as a helocrene spring type (one of 10 types on the forest), which emerges from low-gradient wetlands; often with indistinct or multiple sources. Management direction for springs (which includes cienegas as one of the types) can be found in the FW-Rip-Spring section.

Concern Statement #40: In the revised plan, the Forest Service should modify guidelines in the section for Wetland/Cienega and Reservoirs/Lakes to add "managed herbivory" (i.e., livestock or elk) as a tool to restore waterfowl nesting habitat; remove vegetation, and maintain wetland conditions that provide open water, cover, and other beneficial habitat for wildlife. (85-10)

Response: In response to this comment, this guideline was merged with several other plan components to create a more strategic guideline that addresses all riparian areas and any activities that could impact their natural functions or the habitat they provide. See FW-Rip-All-G-2.

Concern Statement #44: Under Desired Conditions for Water Quality and Water Quantity, the first condition states, "Adequate quantity and timing of water flows are maintained to retain or enhance ecological functions, including aquatic species and riparian vegetation consistent with existing water rights and claims." We recommend removing the word "adequate" unless it is referencing a legal or specific definition. Otherwise, the desired condition should be the "quantity and timing of water flows…." (86-8)

Response: As suggested, the word "adequate" was removed from the first sentence in this desired condition. See FW-Water-DC-6 for the revised version of this desired condition in the Water section.

Concern Statement #45: We recommend re-wording desired condition number 3 to state, "Water rights are sought and procured and existing instream water rights are maintained to ensure that

enough water is guaranteed to provide for habitat and other forest needs, over the long term." (86-9)

Response: As recommended, this desired condition was adjusted. However, in its adjusted state, this plan component is more appropriate as a guideline that was moved to the Water section. See FW-Water-G-3.

Concern Statement #46: The Forest Plan should provide a citation to support the guideline that at least 80 percent of total streambank linear distance should be maintained (FW-Aq-Wat-G-2). (86-10)

Response: After reviewing this guideline in response to your comment, the guideline was edited and the reference to 80 percent of total streambank linear distance was removed. Furthermore, because this guideline applies to streamcourses, it was moved to the Streams subsection in the Riparian section of the Forest Plan. See FW Rip-Strm-G-1.

Concern Statement #47: We recommend re-wording guideline FW-Aq-Wat-G-5 to simply state "Within existing water rights, excess water should be allowed to flow freely back into the existing channel, spring, and riparian habitat to maintain and improve water quality, water quantity, and timing of flows for aquatic species and associated habitat." (86-12)

Response: This guideline has been adjusted to incorporate your suggestion. See FW-Water-G-6.

Concern Statement #48: In the General Description and Background for Stream Ecosystems, the Forest Plan should use the term "functioning" instead of "healthy."(86-13)

Response: The General Description and Background section for the Streams subsection has been edited and "healthy" has been removed as a description in response to your comment. See General Description and Background for Stream Ecosystems in the Riparian Areas section.

Concern Statement #49: In desired condition FW-Aq-Wat-DC-5, we recommend modifying sentence three to state "Flooding creates a mix of stream substrates for fish habitat, and sites for germination and establishment of riparian vegetation." (86-14)

Response: The desired condition has been adjusted to incorporate your suggestion. See FW-Rip-Strm-DC-2.

Concern Statement #68: The Forest Plan should adjust the riparian guideline that addresses modifications to riparian vegetation (see Draft Revised Plan FW-Veg-Rip-G-3) to acknowledge that vegetation management is necessary and appropriate in utility corridors. (69-3)

Response: The Riparian guideline has not been adjusted in response to this comment. The Riparian guideline referenced in the comment was intended to address potential grazing impacts to riparian areas. For that reason, it would be inappropriate and confusing to insert language about vegetation management in utility corridors. To emphasize that this guideline is focused on livestock grazing, it has been moved to the Livestock Grazing section. However, the concern relating to vegetation management associated with utility corridors near riparian areas is addressed by a Special Uses desired condition that acknowledges need and legal mandate to manage vegetation in utility and energy corridors. See FW-SpecUse-DC-2.

Concern Statement #52: We recommend re-wording desired condition FW-Aq-Spr-DC-6 to state, "Plant cover protects the banks, edges, and shorelines of springs. Plant distribution and occurrence is resilient to natural disturbances." (86-19)

Response: The desired condition has been adjusted to address your suggestion. See FW-Rip-All-DC-5.

Concern Statement #53: The third guideline for Springs (FW-Aq-Spr-G-3) states "Open vegetative conditions in the watersheds surrounding springs should be maintained to raise the water table." It is unclear what scale or vegetation type this is referring or what is meant by "open." In order to avoid issues in implementation, we recommend modifying this guideline to clarify when it is being followed and when it is appropriate to deviate from it. (86-20)

Response: The guideline has been adjusted to incorporate your suggestion. See FW-Rip-Spr-G-1.

Concern Statement #54: One of the identified management approaches for springs is "work with partners and stakeholders to develop strategies for restoration of upland watersheds to improve spring flows." Restoration, even as defined in the Draft Revised Plan, is a difficult goal and what is considered restoration in many vegetative communities is still not well-understood. It is also possible that restoration objectives in upland areas may not improve spring flows (e.g., spring flow may be impacted by groundwater pumping in the area). We recommend this management approach be modified to reflect the complexity of the issue surrounding upland restoration and potential modification of spring flows. (86-21)

Response: The management approach has been adjusted to address this comment. The adjusted management approach no longer speaks solely to restoration of upland watersheds. It can be found in the FW-Rip-Spr section and states the following:

> Continue working with partners and stakeholders, including tribes, to inventory, classify, assess, and prioritize springs and recharge areas for restoration, and to implement restoration activities. Include consideration of rare species and endemic species when evaluating springs for restoration.

The complexity of springs is also reflected in plan components that refer to waterflow patterns, recharge rates, discharge, geochemistry, natural solar energy budgets, topography, endemic species, and perched water bearing zones. See FW-Rip-Spr-DC-1, 2, 3, 5; and FW-Rip-Spr-G-1.

Concern Statement #58: The Forest Plan desired condition for Springs (see Draft Revised Plan FW-Aq-Spr-DC-1) should be adjusted to characterize springs as providing functioning habitat, not healthy habitat. The Forest Plan should also define what desirable non-native species (referenced in this desired condition) would occur at springs. (86-17)

Response: The Springs section in the Forest Plan has been modified to incorporate this concept. The plan component has been clarified to indicate that functional soil, water, and vegetative resources are the desired condition. See FW-Rip-Spr-DC-1.

Furthermore, FW-Rip-Spr-DC-2 references native aquatic and riparian species. A guideline would prevent the introduction or spread of disease, invasive, or undesirable species. See FW-Rip-Spr-G-3. A definition for desirable non-native species has been added to the Glossary, but the term is no longer used in the Springs section.

Concern Statement #67: The Forest Plan should recognize that vegetation management is necessary in around springs that occur within utility corridors. (69-1)

Response: Adding a plan component to the Springs section as suggested would limit the suggested direction to areas with springs. To provide more strategic and comprehensive coverage, one of the desired

conditions in the Special Uses section was adjusted to acknowledge the legal mandates that apply to vegetation clearing for utility and energy transmission. See FW-SpecUse-DC-2.

Concern Statement #55: The Forest Service should clearly identify existing groundwater policy. The Forest Plan should include additional plan direction to protect groundwater resources on the forest, to require monitoring (including monitoring of wells on lands surrounding the Forest), and coordination on groundwater and surface water preservation. (74-55, 74-56, 74-59, 74-62, 74-64)

Response: Forest Service Manual direction for groundwater is located in FSM 2880, Minerals and Geology, Chapter 2880 - Geologic Resources, Hazards, and Services. In this context, the term "geologic" applies to geology and all its subdisciplines, including hydrogeology (subsurface waters). FSM 2880 references three technical guides: the Technical Guide to Managing Ground Water Resources, Groundwater-Dependent Ecosystems: Level I Inventory Field Guide, and Groundwater-Dependent Ecosystems: Level II Inventory Field Guide (USDA Forest Service 2007, 2012a and b).

FSM 2540 provides additional direction for groundwater resources in the context of water developments on and off National Forest System (NFS) lands where the NFS has a role in water development or transport. This direction requires consideration of ground and surface water interactions where surface and groundwater are connected. It further recognizes the importance of groundwater in sustaining aquatic and riparian ecosystems.

In general, because existing law, regulation, and policy already articulates other guidance with which the Forest must comply, the direction from those authorities is not repeated in the Forest Plan. As reminders of these other obligations, appendix D in the Forest Plan lists many of these other authorities. For example, references to FSM 2880 and FSM 2540 are included in the Watersheds and Water, Constructed Waters, Riparian Areas section in appendix D of the Forest Plan.

While most of the Forest's groundwater policy is located in the referenced Forest Service Manuals, the Forest Plan contains direction related to groundwater, water flow, and water supply. For example, several desired conditions support conditions that facilitate groundwater recharge. See FW-Water-DC-3, FW-Rip-Strm-DC-3, and FW-Rip-Spr-DC-3. Furthermore, several management approaches in Water and Watersheds remind forest managers to:

> File for water rights on appropriable waters following State procedures. Complete all documentation required for the adjudication process in the Little Colorado and Gila River (Verde watershed) specified by the courts.
>
> Prioritize streams for water right filing based on risk of diversion and subsequent onsite loss of water, and habitat for threatened and endangered aquatic species. Complete required stream gaging and file applications on priority streams. Gaging, filing, and any associated adjudication are completed as budgets allow.
>
> Participate in State water rights adjudications and settlement discussions for negotiating water rights settlements outside of extended adjudication.
>
> Secure water rights through purchase or severance and transfer when additional sources are needed.
>
> Consider water rights during project planning and implementation.
>
> Maintain and annually update an inventory of all water rights on the forest.
>
> Coordinate with Federal, county, and state organizations and interested stakeholders with respect to groundwater and surface water issues including preservation, water quantity and timing of flows.

The Forest Plan includes a Monitoring Plan in chapter 5 that was developed to meet the requirements of the National Forest Management Act and the 1982 Planning Rule. In response to these comments, the Monitoring Plan has been adjusted. To monitor demand on water resources on the Coconino NF, the Monitoring Plan includes the following question:

> Question #10: How many water rights have been procured or how many water rights filings have been done (by Forest Service and by others)?

To monitor water flow and water supply in streams on the Coconino NF, the Monitoring Plan includes the following question:

> Question #11: What are surface water trends for Oak Creek, Wet Beaver Creek, and Fossil Creek?

These streams were chosen because there is ongoing water flow monitoring and due to their ecological and social importance. Changes in the trends for base flows or peak flows in these streams could be indicators for broader trends on the Forest. Identification of management options in response to base flows would be developed at the project level based on site-specific information.

Finally, the Forest acknowledges the value of USGS's Regional Groundwater-Flow Model of the Redwall-Muav, Coconino, and Alluvial Basin Aquifer Systems of Northern and Central Arizona (2011). The Forest uses this flow model when evaluating the potential impacts of projects or activities on the Forest. As with FSM 2880 and FSM 2540, this flow model is referenced in the Watersheds and Water, Constructed Waters, Riparian Areas section in appendix D of the Forest Plan.

Concern Statement #71: The general description for stream ecosystems (pages 21-22) does a good job of pointing out the ecological importance of this ecosystem, and the Desired Conditions are very thorough and appropriate, however, given their importance as cited, it seems as if there should be at least some basic Objectives, Guidelines, Standards, and or Management Approaches, as there are only Desired Conditions. Perhaps this is intentional assuming these are being left to the subsequent, related ecosystems, i.e., springs and riparian, but if this is the case, this should be stated, or they can be added to this section, and re-stated in subsequent sections. (85-4)

Response: In response to your comment, the Forest Plan was reviewed and most of the direction on stream ecosystems was gathered from other sections of the plan and grouped together in the Stream Ecosystems subsection of the Riparian Areas section. For example, guideline FW-Aq-Wat-G-2 was edited and moved to FW-Rip-Strm-G-1, and the aquatic management zone direction found in FW-Veg-Rip-All-G-2 was edited and moved to FW-Rip-Strm-G-2.

Concern Statement #74: The Forest Plan should include management direction for sinking streams. (80-15, 80-16)

Response: A specific desired condition relating to "sinking streams" has not been added. However, the General Description and Background for the Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) section has been modified to specifically highlight sinking streams and the General Description and Background for the Stream Ecosystems section has been modified to direct the reader to the Geological Features section for sinking streams. A guideline requires aquatic management zones to be applied to streamcourses to maintain conditions in connected or downstream caves or karst. See FW-BioPhys-Geo-G-8 which reads:

> Aquatic management zones or best management practices should be applied to perennial, intermittent, or ephemeral streamcourses, to maintain the chemical, physical, and biological conditions of connected or downstream caves, karst, and lava tubes.

There is also plan direction related to aquatic management zones in the All Riparian and Stream Ecosystems subsections of the Riparian Areas section. See FW-Rip-All-G-3 and FW-Rip-Strm-G-2.

Concern Statement #76: The Forest Plan should develop an objective and standard related to the Water Quality and Water Quantity desired condition that addresses the sustainability of stream water quantity and to the occurrence of peak flows and flood potential within the range of historic variability. See Draft Revised Plan FW-Aq-Wat-DC-2. A monitoring program should be developed to determine if base flow levels are being maintained and to identify management options when base flows are not maintained. (74-63)

Response: Standards and objectives in the Forest Plan have not been added in response to this concern. However, a management approach in Watersheds and Water has been modified to remind managers to:

> Coordinate with Federal, county, and State organizations and interested stakeholders with respect to groundwater and surface water issues including preservation, water quantity, and timing of flows.

The Forest Plan addresses base flow, water quantity, peak flows and flooding through a focus on properly functioning soil, vegetation, streams, and riparian within watersheds that would support base flow, precipitation infiltration and groundwater recharge. There is also a focus on characteristic disturbances. See FW-Eco-DC-1, 2, 3; FW-Water-DC-1, 3; FW-Water-G-1; MA-VerdeV-DC-1.

The natural role of water, and channel and floodplain maintenance is highlighted in the sections on All Riparian and Stream Ecosystems. See FW-Rip-All-DC-1, 2; FW-Rip-Strm-DC-1, 3; FW-Rip-RipType-DC-2.

Desired conditions for properly functioning vegetation occurs in individual ERUs, but the section titled All Terrestrial ERUs is comprehensive. See FW-TerrERU-All-DC-1, 2.

Other plan components contribute to having sufficient base flow and rapid recovery from disturbances. These include procurement of instream flow water rights, monitoring best management practices to maintain water quantity, and requiring excess water to remain or be allowed to flow freely into natural channels and habitat to maintain and improve water quantity. See FW-Water-G-1, 3, 4, 6.

Desired conditions in the Soil section promote properly functioning soils to infiltrate water and contribute to suitable hydrologic function; the soil objective focuses on soils that are not functioning properly. See-FW-Soil-DC-2, 3; and FW-Soil-O-1. Water infiltration is also specifically highlighted in grassland and several terrestrial ERUs. See FW-TerrERU-Grass-DC-5, 6; FW-TerrERU-PP-DC-2, 10; FW-TerrERU-MC-MCFF-DC-4, FW-TerrERU-MC-MCIF-DC-4; FW-TerrERU-SF-DC-4; and MA-InBsn-DC-2.

The monitoring strategy in chapter 5 of the Forest Plan includes a monitoring question regarding the surface water trends for Oak Creek, Wet Beaver Creek, and Fossil Creek. See Monitoring Question #11. These streams were chosen because there is ongoing water flow monitoring and due to their ecological and social importance. Changes in the trends for base flows or peak flows in these streams could be indicators for broader trends on the forest. Identification of management options in response to base flows would be developed at the project level based on site-specific information.

Concern Statement #78: The General Description and Background for the Stream Ecosystems section in the Draft Revised Plan should incorporate the following sentence into the paragraph that describes what riparian areas contribute to the ecosystem: "They provide wildlife habitat, increased biodiversity, and wildlife corridors, enabling aquatic, riparian, and terrestrial organisms to move along river systems and thus avoiding isolated communities." (85-3)

Response: This information has been incorporated into the General Description and Background for All Riparian Areas. Stream Ecosystems are a subsection of All Riparian Areas.

Concern Statement #79: In the revised plan, the Forest Service should clarify the distinction between a designated municipal watershed and a municipal water supply, and should include municipal watersheds under special use authorization in addition to areas that have surface water impoundments that provide municipal water, such as C.C. Cragin Reservoir. A reference to C.C. Cragin Reservoir should be added to the Upper Clear Creek General Description and the General Description and Background for Water Quality, Water Quantity, and Aquatic Systems. (78-2, 82-11, 82-15, 82-19)

Response: The General Description and Background section for the Watersheds and Water section has been adjusted to address your concern. In recognition of the unique management concerns associated with the watersheds that serve the C.C. Crain Reservoir, Upper and Lower Lake Mary, and the Inner Basin, the Forest has identified these watersheds as separate management areas. See response to Concern #17 for additional information on these management areas. As adjusted, the General Description and Background section for the Watersheds and Water section recognizes that the watersheds within the C.C. Cragin Watersheds, Inner Basin Watershed, and Lake Mary Watersheds Management Areas contribute water to public water systems.

Concern Statement #80: Upper Lake Mary, the Woody Mountain Well Field, and the Lake Mary Well Field should be included in the discussions on municipal watersheds and municipal water supplies in the General Description and Background for the Watersheds section in the Forest Plan. (78-4)

Response: References to these areas have been incorporated into the General Description and Background sections of the relevant management areas. Upper Lake Mary and the Lake Mary Well Field are recognized as sources of water for the City of Flagstaff in the General Description and Background section of the Lake Mary Watersheds Management Area. The Woody Mountain Well Field is recognized as a source of water for the City of Flagstaff in the General Description and Background section of the Pine Belt Management Area.

Concern Statement #81: The Forest Plan should address water sources for municipalities in the Conditions and Trends section in Chapter 1. (82-9)

Response: This Background section in the Forest Plan is a summary of trends and conditions that were identified in the early phases of the planning effort and is accurate as written. Although this section does not specifically mention water sources for municipalities or C.C. Cragin, the Forest Plan provides direction that addresses water sources for municipalities. See the forestwide direction in the Watersheds and Water section and the management area direction in the Inner Basin, Lake Mary Watersheds, and C.C. Cragin Watersheds Management Areas.

Concern Statement #85: The Forest Plan should recognize that coordination on water quality should address more than just the threat of fertilizers to downstream resources on the forest. (82-17)

Response: The management approach has been adjusted to incorporate your suggestions. See FW-Water-Management Approach, which states:

> Collaborate with volunteers, other agencies, private landowners, and other stakeholders on education, interpretation, and monitoring relating to water quality, public health, and fish and wildlife habitat especially in regards to threats to water quality from leaking septic tank systems; threats to water supply and water quality from wildfires; threats to downstream resources from the use of fertilizers;

and threats to health and resources from improper disposal of diapers and other garbage or when state water quality standards have been exceeded.

Concern Statement #86: Chapter 2. Forestwide Management, page 23 - General Description for Wetland/Cienega and Reservoirs/Lakes: add C.C. Cragin as impoundment for municipal water use. (82-18)

Response: Reservoirs and other constructed waters have been reorganized into a new section titled "Constructed Waters." The General Description and Background section of the Constructed Waters section lists the 14 reservoirs on the Coconino NF, including the C.C. Cragin Reservoir.

Concern Statement #87: The management approach in the Watersheds section of the Draft Revised Plan should be adjusted to list the United States Geological Survey (USGS) as one of the entities that will be coordinated with on long-term and landscape studies of watershed function. The USGS Western Science Center is currently collaborating with the Coronado National Forest to conduct relatively inexpensive and effective remote sensing techniques for evaluating hydrological conditions at the 4th and 5th HUC code scale. (85-2)

Response: The management approach has been adjusted to incorporate a reference to the U.S. Geological Survey as suggested. See FW-Water-Management Approaches, which states:

> Coordinate with the Rocky Mountain Research Station, U.S. Geological Survey and other research organizations on long-term and landscape studies of watershed function.

Concern Statement #101: The Forest Service should consider an alternative that prohibits new road construction, restricts increases in road density in key watersheds, encourages a reduction in road density to less than two miles per square mile, and includes management approaches prioritizing the removal of roads that are affecting aquatic ecosystem functions. (84-65, 84-103)

Response: An alternative to forbid new road construction was considered to not be feasible. See the "No road construction" topic in the Alternatives Eliminated from Detailed Study section in chapter 2 of the Final Environmental Impact Statement. For example, new road construction may be required when access to a particular resource or private inholding is needed. New motorized trails may be needed to provide motorized recreation opportunities, including destinations and loops. Alternatives B (modified), C, and D address the impacts of roads and motorized trails on forest resources. Any new road or motorized trail construction would only be authorized following project-level NEPA analysis and would be accomplished using best management practices to minimize resource impacts while providing for forest access needs.

An alternative establishing limits on road density was not considered because road impacts to both wildlife and watersheds are more complex than simple road densities and may be equally affected by road design and location, therefore consideration of specifying road densities was eliminated from further deliberation in the action alternatives. See the "Specification of road densities" topic in the Alternatives Eliminated from Detailed Study section in chapter 2 of the Final Environmental Impact Statement for additional information. While alternative A (1987 plan), however, does include standards and guidelines related to road densities, all alternatives include language to mitigate road impacts to wildlife and watersheds. For example, alternatives B (modified), C, and D contain many components that address sediment that may be associated with the management of roads and infrastructure. See FW-Rip-All-DC-1; FW-Rip-All-G-2; FW-Rip-Strm-DC-3; FW-Rip-Strm-G-2; and FW-RdsFac-G-2. In addition, chapter 4 of the Forest Plan, under Recreation and Transportation Suitability, clarifies that the decisions associated with the Travel Management Rule and subsequent updates, designate roads, trails, and areas suitable for motorized vehicle use.

Development of an alternative with management approaches prioritizing the removal of roads that are affecting aquatic ecosystem functions is not necessary because such a management approach is already included in most of the action alternative. Alternatives B (modified), C, and D include a management approach in the Roads and Facilities section that reminds forest managers to prioritize the naturalization of decommissioned roads that are affecting aquatic ecosystem functions. It states:

> Factors in prioritizing the naturalization of decommissioned and unauthorized roads include the following:
>
> - Watershed Condition
>   - Soils that are receiving, or are expected to receive, damage to the extent that soil productivity is or will be significantly impaired outside of the road prism.
>   - Riparian areas (e.g., springs, wetlands, or stream reaches) that are impaired or non-attaining due to sedimentation or alterations to hydrology related to the road.
>   - Meadows at the TES montane meadows polygon map unit scale that are likely to be or are being damaged.
>   - Poorly located, designed, or maintained roads connected to downstream impaired or non-attaining waters, where potential for increased runoff and sedimentation is high.

Alternatives B (modified), C, and D reiterate that the process established under the Travel Management Rule that identifies roads to remain open and, by default, roads that can be decommissioned. The analyses associated with the Travel Management Rule would also address issues associated with legacy roads and sedimentation into drainages and key watersheds.

Water Quality

Concern Statement #125: The Forest Plan should require the analysis of management effects to both water quality and quantity before approval or adoption of any site-specific action. (84-99)

Response: No change to the Forest Plan has been made in response to this comment. It is not necessary to include a general requirement in the Forest Plan to consider management effects to water quality and water quantity in every site-specific action. Resources that are potentially affected by a site-specific proposal are identified through internal and public scoping. If it is determined that water quality and/or water quantity may be impacted by the proposal, then they will be addressed in the environmental analysis that is prepared in compliance with the National Environmental Policy Act.

Concern Statement #88: The Forest Service should require implementation of total maximum daily loads (TMDL) recommendations and explain how TMDLs will be implemented. (56-25, 74-21, 84-56)

Response: A guideline in the Watersheds and Water section has been adjusted to address these comments. The word "considered" has been replaced with "implemented." See FW-Water-G-5.

The Forest Plan establishes a framework and strategy for management activities but generally does not prescribe specific approaches, such as how to implement a TMDL. Implementation would be worked out at the project level. There are several management approaches related to TMDLs to provide input and recommend strategies for, and to implement existing TMDLs. In the Watersheds and Water section, there is a management approach that reminds forest managers to:

> Provide input and recommend strategies for implementation plans as required by Arizona Revised Statute 49-234 for existing TMDLs to provide strategies to reduce existing pollutant loads identified in TMDLs and to be in compliance with applicable water quality standards for impaired waters.

In the Stream Ecosystems section, there is a management approach that reminds forest managers to:

> Coordinate with the Arizona Department of Environmental Quality to monitor and achieve acceptable total maximum daily loads (TMDLs) suspended sediment concentration in the Verde River.

Concern Statement #89: In the revised plan, the Forest Service should broaden the definition of "ground-disturbing activities" in FW-Aq-Wat-G-3 because the current definition is too narrow to fully encompass the numerous activities that may disturb soil. (56-26, 84-57)

Response: The guideline has been adjusted to address your concern that, as defined, the term "ground-disturbing activities" is too narrow and would not protect water quality. The guideline has been rewritten to incorporate your suggestions. See FW-Water-G-4. In addition, the term "ground-disturbing" has been removed from the glossary. The definition was too narrowly focused on impacts to archaeological sites and did not fully encompass other actions that could impair water quality or impact other resources.

Concern Statement #104: The guideline in the Sedona/Oak Creek Management Area in the Forest Plan that addresses vehicle crossings of Dry Creek (see Draft Revised Plan, MA-SedOak-G-7) should be changed to a standard that prohibits vehicle crossings because of concern for water quality. (74-101)

Response: After reviewing this guideline in response to your comment, it was determined that water quality concerns are already adequately addressed by forestwide plan direction. See FW-Soil-G-1; FW-Water-G-4; FW-Rip-Strm-G-;, FW-RdsFac-G-1, 2, 5; and FW-Rec-All-G-2. Because the water quality concerns associated with Dry Creek are already addressed by forestwide plan direction, this guideline was removed from the Forest Plan.

Concern Statement #105: The Forest Service should manage roads and infrastructure to reduce sediment pollution. (56-18, 84-48)

Response: The Forest Plan contains many components that address sediment that may be associated with the management of roads and infrastructure. See FW-Rip-All-DC-1; FW-Rip-All-G-2; FW-Rip-Strm-DC-3; FW-Rip-Strm-G-2; and FW-RdsFac-G-2. In addition, chapter 4 of the Forest Plan, under Recreation and Transportation Suitability, clarifies that the decisions associated with the Travel Management Rule and subsequent updates, designate roads, trails, and areas suitable for motorized vehicle use. The analyses associated with the Travel Management Rule would also address issues associated with legacy roads and sedimentation into drainages.

Concern Statement #106: The Plan should include direction to address E. coli pollution in streams. (56-27, 56-28, 84-58, 84-59)

Response: Arizona Department of Water Resources is responsible for monitoring water quality. Local county health departments are responsible for advisories restricting designated uses such as swimming. Two Management Approaches were added to the Watersheds and Water section, which state:

> Collaborate with volunteers, other agencies, private landowners, and other stakeholders on education, interpretation, and monitoring relating to water quality, public health, and fish and wildlife habitat especially in regards to threats to water quality from leaking septic tank systems; threats to water supply and water quality from wildfires; threats to downstream resources from the use of fertilizers;

and threats to health and resources from improper disposal of diapers and other garbage or when state water quality standards have been exceeded.

Provide input and recommend strategies for implementation plans as required by Arizona Revised Statute 49-234 for existing TMDLs to provide strategies to reduce existing pollutant loads identified in TMDLs and to be in compliance with applicable water quality standards for impaired waters.

Restricting access and human use is an action that could be taken if water quality is not in desired condition. A decision to implement these type of restrictions would be based on site-specific information and analysis.

The Forest Plan has several plan components relating to water quality including meeting or exceeding Arizona water quality standards, improving water quality, and implementing approved total maximum daily load recommendations for impaired or non-attaining waters. See FW-Water-DC-7; FW-Water-G-5; and FW-Rip-All-DC-3, 4. A guideline in the Oak Creek Management Area would require recreation management to maintain water quality. See MA-OakCrk-G-9. Finally, an item in the Monitoring Plan would track Forest changes to Arizona Department of Environmental Quality impaired or non-attaining list.

Concern Statement #121: The Forest Service should provide information on the current condition of riparian and aquatic ecosystems and associated aquatic species and describe the successes and failures of current management. The Forest Service should also discuss the effects of livestock grazing, historical pollution from mining activities, motorized recreation, and climate change on riparian ecosystems and associated aquatic species. (84-34, 84-37)

Response: The environmental impact statement includes a summary of the current condition of riparian and aquatic ecosystems on the Coconino NF in the Watersheds and Water and Riparian Areas sections in chapter 2. Additional information on current conditions is available in the Water Quality, Quantity and Watershed Specialist Report (USDA Forest Service 2016e), the Riparian Specialist Report (USDA Forest Service 2016h), the Analysis of the Management Situation (USDA Forest Service 2010a), and the Ecological Sustainability Report (USDA Forest Service 2009a).

The environmental impact statement also includes a summary of the current condition of aquatic species in the Wildlife, Fish, and Plants section in chapter 2. Additional information on the aquatic species associated with the riparian and aquatic ecosystems on the Coconino NF is available in the Aquatics Species Specialist Report (USDA Forest Service 2016i), the Biological Assessment (USDA Forest Service 2017a), the Analysis of the Management Situation (USDA Forest Service 2010a), and the Ecological Sustainability Report (USDA Forest Service 2009a).

In preparation for forest plan revision, the Coconino NF identified guidance in the 1987 plan that is working, new conditions that need to be addressed, and ongoing challenges that could be better addressed. This preparatory work is documented in the Analysis of the Management Situation, completed in May 2010 (USDA Forest Service 2010a). Through the Analysis of the Management Situation the Coconino NF identified current ecological and socioeconomic conditions and trends taking place on the Forest and the associated “needs for change” to be addressed in the revised plan. The needs for change are grouped under three broad revision topics: (1) recreation, (2) forest community interaction, and (3) maintenance and improvement of ecosystem health. See the Needs for Change section in chapter 1 of the environmental impact statement and the Analysis of the Management Situation for additional information

The effects of human-related impacts, livestock grazing and motorized recreation, on riparian and aquatic ecosystems and associated aquatic species are discussed in the Watersheds and Water, Riparian Areas, and Wildlife, Fish, and Plants sections in chapter 3 of the environmental impact statement. Additional

information on the effects to riparian and aquatic ecosystems and associated aquatic species is available in Water Quality, Quantity and Watershed Specialist Report (USDA Forest Service 2016e), the Riparian Specialist Report (USDA Forest Service 2016h), the Aquatics Species Specialist Report (USDA Forest Service 2016i), and the Biological Assessment (USDA Forest Service 2017a).

The potential consequences of climate change to riparian and aquatic ecosystems on the Coconino NF are discussed in the Climate Change section in chapter 3 of the environmental impact statement. The potential consequences of climate change to aquatic species are discussed in the Wildlife, Fish, and Plants section in chapter 3 of the environmental impact statement.

Wildland Fire Management

Concern Statement #96: The Forest Plan should have more information on post-fire restoration of critical water supply facilities. (78-6)

Response: Direction for post-fire restoration is covered under Forest Service Manual and Handbook direction for Watershed Protection and Management. See Forest Service Manual 2500 Watershed and Air Management Chapter 2520 Watershed Protection and Management and Forest Service Handbook 2509.13 Burned Area Emergency Response (BAER) Handbook. Post-fire evaluation and recommendations are done on a fire-specific basis and not addressed in the Forest Plan. During BAER analysis, critical values, resources, and threats are identified. Values (life, safety, property, etc.) and resources (natural or cultural) are described in terms of the nature and magnitude of the threat. Water supply facilities could be identified as values at risk and emergency treatments could be proposed to alleviate the risk.

Concern Statement #141: The Forest Service should not equate post-fire logging with restoration and should consider the potential environmental impacts of post-fire logging. (84-66, 84-72)

Response: Whether post-fire salvage logging is characterized as ecological restoration will be determined at the project level. The Forest Plan provides desired conditions that will guide future management. If post-fire salvage logging is pursued under the Forest Plan, it will need to meet or move toward the desired conditions in the Forest Plan. A management approach in the All Ecosystems section reminds forest managers:

> Following large or uncharacteristic disturbance events, focus management actions on human health and safety, long-term restoration, soil and watershed stabilization, restoration or protection of ecosystem processes and resource values.

Whether the proposed logging meets or moves the project area toward the desired conditions in the Forest Plan will be determined at the project level based on impacts and other information disclosed in site-specific analysis.

Concern Statement #201: The revised Plan should promote fire for the restoration of grasslands to restore their natural composition, structure, and function. (56-48)

Response: The desired conditions in the revised Forest Plan for grasslands acknowledge that frequent surface fires are desirable in all grassland ERUs except for Verde Formation soils. See FW-TerrERU-Grass-DC-2. Because invasive annual species can influence the spread, intensity, or severity of uncharacteristic fire, and increase in response to fire, fire may not always be the most appropriate management tool. A desired condition for Fire Management promotes wildland fires burning within the historic fire regime of the vegetation communities affected. See FW-Fire-DC-2. The revised plan does not prohibit the use of wildfire managed for resource objectives in WUI like the current plan does, and promotes the use of naturally ignited fires in fire-adapted ERUs when burning conditions facilitate progress toward desired conditions. See FW-TerrERU-All-G-2. A desired condition for All Terrestrial

ERUs promotes natural and human disturbances that provide desired overall plant density, species composition and structure, and promotes the restoration of desired disturbance regimes (including fire) where practical. See FW-TerrERU-All-DC-2.

Concern Statement #203: The Forest Service should stop activities that may cause ecological harm and actively use wildland fire to achieve restoration. (56-34, 56-37, 56-39, 84-68)

Response: The Forest Plan provides a comprehensive framework to guide future decisions on projects and activities on the Forest. The Forest Plan includes desired conditions for functioning and resilient resources based on a range of historic conditions. The Forest Plan includes other components that ensure that projects and activities are designed in a manner that maintains or moves the Forest toward these desired conditions and prevents ecological harm.

In response to this comment, a definition for the term "restoration" has been added to the Glossary. It states that restoration is:

> The process of assisting in the recovery of an ecosystem that has been degraded, damaged, or destroyed (Society for Ecological Restoration International 2004). Ecological restoration focuses on establishing or re-establishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystem sustainability, resilience, and health under current and future conditions. Accordingly, any project or activity that assists in the recovery of a degraded, damaged, or destroyed ecosystem can be considered restoration. Restoration can be active or passive. Treatments that move ecosystem components toward desired conditions are considered restoration as are removal of impacts. Allowing natural processes to move ecosystem components toward desired conditions can also assist in the recovery of an ecosystem. General Technical Report RMRS-GTR-310 provides a framework for restoration of ponderosa pine and mixed conifer with frequent fire (Reynolds et al. 2013).

The decision to restore an area and what techniques might be appropriate (e.g., active or passive restoration) would be made at the project level based on site-specific conditions, not at the plan level. Site-specific conditions would include current and desired vegetation conditions, fire or disturbance history, threats, and other resource values. The decision on whether wildland fire is the appropriate tool for use at a particular time and place is decided at the time of natural ignition. Wildland fire may be a tool in areas where mechanical treatments are not appropriate, such as in wilderness. Considerations in deciding whether wildland fire is an appropriate tool could include, but are not limited to, fuel loading, proximity of wildland-urban interface, threats to life and property, fire regime, capacity to manage the fire, and weather.

The Forest Plan provides desired conditions that will guide future management. A desired condition in the Fire section acknowledges the desire for wildland fires to burn within the historic fire regime of the vegetation communities affected. See FW-Fire-DC-2. If wildland fire is used as a restoration tool under the Forest Plan, it will need to meet or move toward the desired conditions in the Forest Plan. Wildland fire may not always be the appropriate tool to achieve restoration in every situation. In areas where fire has been removed from the landscape over a long period of time, introducing fire without some level of mechanical treatment could result in uncharacteristic fire behavior, which would not meet the desired conditions of other resources or programs on the Forest. See FW-Eco-DC-3 and FW-TerrERU-DC-DC-3.

Concern Statement #316: The Forest Plan should not create more quiet areas, but instead should provide for motorized access to respond to wildland fire and to maintain the Forest to reduce the potential for wildland fire hazards. (109-2)

Response: Specific motorized use determinations are done through project-level decision making, including the implementation of the Travel Management Rule (36 CFR §212). Motor vehicle use on the Forest has been and continues to be addressed through implementation of that rule.

The Forest Plan has several components that address access for fire management activities. A desired condition in the Roads and Facilities section seeks to provide reasonable motorized access to the public, city, county, State, and other Federal entities for permissible uses, such as fire management. See FW-RdsFac-DC-1. A standard included in that section prohibits motor vehicle use beyond the designated system of roads, trails, and areas, as defined on motor vehicle use maps. The standard includes an exception for those uses authorized by law, permits, and orders in connection with resource management and public safety. See FW-Rec-Disp-S-1.

Desired conditions for the wildland-urban interface promote safe and efficient suppression and the protection of human life and property. See FW-WUI-DC-1, 2.

There are also management approaches in Fire Management to facilitate responses to wildland fire and address safety concerns and access:

> Coordinate with other jurisdictions such as communities, service providers (infrastructure), and Federal, State, county, and local entities regarding prevention, preparedness, planned activities, and responses to wildland fires. Notify the above regarding the upcoming and ongoing fire season and any prescribed fire activity.
>
> Coordinate access for initial attack and suppression activities with responsible jurisdictions to reduce response times and address public and firefighter safety.

Concern Statement #495: The Forest Plan should include direction on fire and its role in ecological processes. (65-9)

Response: There are numerous places in the plan that address fire and its role in the ecological process, especially for fire-adapted ecosystems: FW-Eco-DC-1; FW-TerrERU-All-DC-2; FW-TerrERU-All-G-2; FW-TerrERU-Grass-DC-2; FW-TerrERU-IC-DC-3; FW-TerrERU-PJ-DC-3, 8, 13, 14; FW-TerrERU-AspMpl-DC-2; FW-TerrERU-PP-DC-3, 11; FW-TerrERU-MC-MCFF-5, 8; FW-TerrERU-MC-MCIF-DC-4, 7; and FW-TerrERU-SF-4, 5, 8.

In addition a management approach in All Terrestrial ERUs reminds managers that:

> Fire is essential for ecosystem function and for maintaining or moving toward desired conditions in ecosystems where fire is the primary natural disturbance. Primary natural disturbances in Desert Communities, Alpine Tundra, and riparian areas do not include fire, but rather include flooding, precipitation, temperature, wind, avalanches, and ultraviolet radiation. When used as a tool, fire can effectively restore forest structure when used alone or when combined with mechanical treatments. Mechanical treatments may be costly, so the capacity to implement such treatments across the landscape may be limited. Strategic placement and design of mechanical treatments increases their effectiveness in protecting values at risk.

Concern Statement #667: The Forest Plan should clarify whether fire suppression of naturally ignited wildfires is considered a "decision" that requires consultation under Section 7 of the Endangered Species Act. (86-56)

Response: Plan language has not been changed in response to this comment; however, the Final Environmental Impact Statement will clarify this issue. Acres of naturally ignited fire are included in the objectives for some ERUs. The acres of naturally ignited fires represent an estimate of acres in specific

ERUs that could be burned based on historical use of naturally ignited fires. These acres were used in vegetation modelling. Although objectives are plan decisions, consultation on naturally ignited wildfires will occur separately from consultation with the U.S. Fish and Wildlife Service on the Forest Plan. Naturally ignited wildfires are considered an emergency action that requires expedited consultation and consultation occurs on a fire-specific basis. This is guided by 50 CFR 402.05 and direction in Forest Service Manual 2671.45f. The approach of the Forest Plan is to not repeat law, regulation, and policy.

Concern Statement #688: The Forest Service should assess more than the degree of fire regime departure from a narrowly defined historical condition (fire regime condition class) and disclose implications of climate change on wildland fire and management options in the future. (84-82)

Response: The Vegetation and Fire section in chapter 3 of the environmental impact statement assesses other topics (e.g., hazards associated with wildland-urban interface, vegetation structure, and cumulative environmental consequences) in addition to the degree of fire regime departure from fire regime condition class (FRCC). The degree of departure from natural fire regimes expressed through FRCC is a useful approach to evaluate the resiliency of an ecosystem. The Air Quality section in chapter 3 of the environmental impact statement assesses air quality related to smoke from wildfires and prescribed fires.

The environmental impact statement includes a section on Climate Change in chapter 3, which addresses both the potential impacts of climate change on the resources on the Forest and the potential impacts of forest management activities on climate change. This section acknowledges that climate change may result in considerable alterations to natural disturbance regimes and it provides examples of potential changes that may occur in the Southwest. This section also recognizes that the desired conditions associated with alternatives B (modified), C, and D integrate climate change and focus on resilience. These desired conditions would allow different management tools and activities, including the use of natural fire, as well as new research to be considered in order to continue making progress toward stated desired conditions, even if climate change or other disturbances were to affect forest conditions during the life of the Forest Plan.

Wilderness Resources

Concern Statement #13: The Forest Service should manage areas with wilderness characteristics to protect them from impacts in the future. (5-4)

Response: The Forest conducted a potential wilderness area evaluation as part of this forest plan revision effort. See the Potential Wilderness Area Evaluation Report (USDA Forest Service 2016j) for the details on this effort. That evaluation was used to identify the potential wilderness areas that should be recommended for designation. Alternative B (modified) includes three recommended wilderness areas and alternative C includes 13 recommended wilderness areas. These are the areas that were identified with sufficient wilderness characteristics to consider recommending them for wilderness designation. Both of these alternatives include direction to manage these recommended wilderness areas to maintain their wilderness characteristics. See SA-RWild-DC-1 through 6 and SA-RWild-G-1 through 5. These plan components will apply to the recommended wilderness areas until Congress decides whether to designate them as wilderness. If they are designated as wilderness, the plan components for designated wilderness would provide management that retains the wilderness character of these areas. See the SA-Wild section of the Forest Plan.

Concern Statement #139: The analysis in the Soils section in the environmental impact statement should acknowledge that areas recommended as wilderness or classified as semi-primitive non-motorized on the Recreation Opportunity Spectrum provide most protection to impacts on soils from roads, motorized trails, and off road OHV traffic. (11-3)

Response: The analysis in the Soil section in chapter 3 of the environmental impact statement does acknowledge that areas recommended as wilderness or classified as semi-primitive non-motorized (SPNM) on the Recreation Opportunity Spectrum (ROS) provide the most protection to impacts on soils from roads, motorized trails, and off road OHV traffic.

Furthermore, the Water and Watershed section in chapter 3 of the environmental impact statement goes on to say that with current implementation of the Travel Management Rule, existing camping corridors and designated roads are already located in soils with low risk to soil productivity, and away from montane meadow soils, riparian areas, and connected waters, and these areas are already protected from OHV traffic. A possible increase in camping corridors or road designation would only occur on sites with low risk to soil productivity, riparian function, and water quality, and therefore, additional protection offered for camping corridors and future roads in recommended wilderness would not better protect soil productivity, riparian function, or water quality than if the areas were not recommended. In addition, the Recreation and Transportation Suitability table in chapter 4 of the Forest Plan identifies semi-primitive non-motorized (SPNM) ROS, recommended wilderness, and designated wilderness as not suitable for new motorized areas or permanent roads. Recommended wilderness and designated wilderness are also not suitable for temporary roads. Motorized use, mechanized use, and new roads are not allowed in designated wilderness.

Soil conditions in areas recommended as wilderness or classified as SPNM on the ROS would not necessarily improve simply through these designations. Some impaired or unsatisfactory soils in areas recommended for designation as SPNM may be the result of high tree density or interruptions in fire return intervals and not the result of roads and motorized access. Without roads and motorized access in these areas, there would be fewer opportunities to conduct mechanical vegetation treatments or safely reintroduce fire, allowing impaired or unsatisfactory soil conditions to persist. For example, areas invaded by pinyon and juniper would likely continue to erode since vegetative treatments to reduce pinyon and juniper basal area and improve herbaceous ground cover would be less likely to occur. Where impaired or unsatisfactory soil conditions exist as a result of motorized access, these areas are likely to improve. Satisfactory soil condition in areas designated as SPNM would be maintained.

Where impaired or unsatisfactory soils occur in wilderness areas, these conditions would likely persist, as it is very unlikely that treatments would be implemented in wilderness areas that would alter natural processes or wilderness character. Satisfactory soil condition in areas recommended as wilderness would be maintained.

The proposed new wilderness areas are currently in areas with very little soil disturbance caused from human activities. Off-road motorized travel is already very limited under all alternatives due to implementation of the Travel Management Rule, and is generally only allowed on routes designated on the motor vehicle use map. Under alternative B (modified), Strawberry Crater addition and Davey's recommended wildernesses have no roads open for public or administrative use. The Abineau recommended wilderness area would only impact 0.1 mile of road open for administrative use and no roads open for public use. The removal of these limited number of miles do not result in an appreciable difference to soil condition at the forest level.

Under alternative C, recommended wildernesses would impact 10.6 miles of road open to the public and an additional 5.1 miles of road available for administrative use. No roads are available for public or administrative use in Davey's, Abineau, Railroad Draw, Barbershop, and East Clear Creek. The majority of roads available for public use or administrative use are in Black Mountain and Cedar Bench with lesser amounts in the remaining recommended wildernesses. Impaired or unsatisfactory soil conditions as a result of motorized access would likely improve in localized areas within these areas.

In alternative C, recommended wilderness may not confer additional protections to Barbershop and East Clear Creek recommended wildernesses because these areas overlap with existing inventoried roadless areas and both areas are designated as eligible wild and scenic rivers. Consequently, soil would be also protected from these other designations. Walker Mountain, Hackberry, and Cimarron-Boulder also overlap with existing inventoried roadless areas.

Concern Statement #265: Some commenters supported or opposed all or some of the recommended wilderness areas included in alternatives B and C. Some commenters suggested that additional recommended wilderness areas not be included in alternatives B and C be considered. Some commenters asked for more information on the rationale that was used to select recommended wilderness areas for the alternatives. One commenter suggested that surface and groundwater resources should be a factor considered when evaluating the capability of a potential wilderness area. (3-1, 4-1, 5-3, 13-3, 17-2, 24-6, 40-1, 48-8, 48-11, 49-3, 56-108, 56-109, 56-110, 56-111, 56-112, 56-113, 56-114, 56-115, 56-116, 56-117, 56-118, 56-119, 56-120, 66-2, 67-2, 69-28, 69-31, 69-41, 69-43, 71-2, 71-3, 71-7, 72-7, 74-20, 74-22, 74-23, 74-24-74-25- 74-28, 74-30, 74-31, 74-32, 74-33, 74-34, 74-35, 74-36, 75-35, 75-36, 75-37, 77-5, 79-3, 79-4, 79-5, 82-3, 94-5, 94-12, 95-1, 1787-1)

Response: The Forest received comments suggesting that some or all of the potential wilderness areas (PWAs) should be included or removed from the alternatives for a variety of reasons. The Forest was also asked to explain why some PWAs were included in alternative B as recommended wilderness areas while other, apparently similar, PWAs were not included in alternative B. One of the main questions centered on why some PWAs with an availability ranking of "medium" were included in alternative B while others were not. In response to these comments, the Forest reviewed the wilderness evaluation effort and identified ways to respond to these comments.

The 1987 forest plan is being revised under the 1982 Planning Rule. The process for identifying and evaluating PWAs under the 1982 Planning Rule is described in Forest Service Handbook 1909.12 Chapter 70 (effective date January 31, 2007). Following this process, the Forest prepared a Potential Wilderness Evaluation Report and a Wilderness Need Evaluation. These documents were used to determine which PWAs should be included in alternatives developed for the forest plan revision effort. The Wilderness Evaluation Report and Wilderness Need Evaluation are included in the project record and are available on the Coconino NF's website at: http://www.fs.usda.gov/project/?project=32780.

The wilderness evaluation process began by inventorying the entire Forest to develop an initial list of PWAs. The inventory process is described in appendix A of the Wilderness Evaluation Report (USDA Forest Service 2016j). The inventory criteria were applied based on local knowledge and judgment regarding unique, site-specific conditions of each area being considered for placement on the inventory of potential wilderness. This information was gathered using GIS data available at the time of the inventory and the knowledge of District and Forest staff concerning inaccuracies in that data and on-the-ground experience. This process identified 37 PWAs that were determined to meet the criteria.

These 37 areas that met the inventory criteria were evaluated for wilderness capability following FSH 1909.12 Chapter 72.1 (effective date January 31, 2007). The capability ranking identifies the presence of wilderness character (Natural, Undeveloped, Outstanding opportunities for solitude and primitive recreation, special features and values, and manageability). The presence of non-native species can affect the capability ranking. Ten of these areas rated high in capability and were taken forward for further analysis into the availability and need analysis because they exhibit the necessary wilderness character. Five of these areas that rated medium in capability were taken forward for further analysis into the availability and need analysis in response to requests from the public.

The wilderness characteristics used to determine a capability ranking according to the process described in FSH 1909.12 Chapter 72.1 (effective date January 31, 2007) include several factors related to surface and groundwater resources. One question asks if the rivers within the wilderness area are in free-flowing condition. Another question asks if there are pollutants present that degraded the water within the wilderness areas. Additional factors related to surface and groundwater resources were not added to the capability analysis. However, the potential effect of recommending an area as wilderness is analyzed in the Watersheds and Water section in chapter 3 of the Final Environmental Impact Statement. That analysis concluded that designation of any of the recommended wilderness areas would not improve watershed condition and function, because human disturbance in those areas is very limited already due to inaccessibility or steep slopes and natural disturbances are for the most part, outside human control. Consequently, water and soil resources improvement in the recommended wilderness areas would be very minor and not measurable or enough to change watershed function.

These 15 PWAs were then ranked for availability and need. The availability ranking weighs value of and need for the wilderness resource compared to the value of and need for other resources. The need rankings are based on the PWA's potential contributions of wilderness opportunities, in terms of social and ecological considerations, to the National Wilderness Preservation System. The Bismarck and Whitehorse PWAs were not carried forward because the Arizona National Scenic Trail crosses them; designating these areas as wilderness would conflict with the desire to allow mechanized use on this trail.

Through this process, 13 PWAs were identified. Alternative C proposes to recommend PWAs for a variety of reasons discussed in the Draft Environmental Impact Statement. Some commenters questioned the reasons offered for the inclusion of these three PWAs and asked the Forest to clarify the rationale.

To provide a more definitive process for identifying the PWAs to include in the alternatives, the Forest developed a 3-step process and re-examined the 13 PWAs that were included in alternatives analyzed in detail in the Draft Environmental Impact Statement. Additional information on this process is available in the Public Involvement and Alternative Development section in the Potential Wilderness Evaluation Report.

The first step removed all PWAs that did not have a rating of medium or higher for capability, availability, and need. This removed the White Horse, Bismark, Railroad Draw, and Deadwood Draw PWAs, all of which were rated low for availability. Applying this screen ensured that the PWAs that were being considered for recommendation were not of low quality or burdened with long-term commitments of resources for incompatible uses or difficult conflicts if the area were designated as wilderness.

The second step considered the availability rating. In response to a comment on how the availability process resulted in unduly low ratings, the Forest reviewed the process for determining availability. That process is described in appendix C of the Potential Wilderness Evaluation Report. That process applies an availability rating of medium to a PWA that has two or more resources that have planned or existing uses that are not compatible with designated wilderness. The Forest reviewed and confirmed that each PWA with a medium availability rating had two or more resources that have planned or existing uses that are not compatible with designated wilderness. However, during this review it was observed that some of these PWAs had many more than two of such resources. It was also observed that the distribution of these resources across a PWA varied widely.

Taking this information into account, the Forest decided to review the availability rating on every PWA. As noted above, a rating of medium is applied to a PWA when it has two or more resources that have planned or existing uses that are not compatible with designated wilderness. Still, there can be a substantial difference between a PWA with a few incidences of these resources and another PWA with many instances of these resources. Furthermore, the weight to be given to these resources can vary based

on their location within the PWAs. Resources on the periphery may impact the PWA less than resources located deeper within the PWA because access to and activities associated with these resources would have less impact on the character of the PWA.

To differentiate between PWAs given an availability rating of medium, the Forest decided to break the medium rating into two parts. While both parts would still have two or more resources that have planned or existing uses that are not compatible with designated wilderness, one part would have fewer incidences of such resources and those resources would be located closer to the outer edges of the PWAs. These PWAs were given a rating of "medium +." The other part of the PWAs with a medium availability rating would be the remaining PWAs that had many resources that have planned or existing uses that are not compatible with designated wilderness, and/or PWAs where those resources were not located near the outer boundaries of the PWA. These PWAs were given a rating of "medium."

To complete the availability rating step, the Forest removed all PWAs that did not have an availability rating of "medium +" or higher. This removed the Cedar Bench, Black Mountain, Cimmaron-Boulder, Hackberry, and Tin Can PWAs areas from consideration for alternative B. The purpose of this screen was to compensate for the wide range that was established by the medium category for availability. Rather than choose all or none of the PWAs with a medium category of availability, this screen provided a process to select PWAs that were on the high end of the medium category of availability. Additional information on this part of the process is available in the Public Involvement and Alternative Development section in the Potential Wilderness Evaluation Report.

The third step removed the PWAs that were in inventoried roadless areas (IRAs). This removed the Walker Mountain, East Clear Creek, and Barbershop PWAs. The purpose of this screen was to retain management flexibility in areas that already had comprehensive management direction for resource protection. The Forest Plan protects IRAs through application of a desired condition and standard to maintain the overall roadless character in IRAs (see SA-IRA-DC-1 and SA-IRA-S-1) and through implementation of the 2001 Roadless Area Conservation Rule. The 2001 Roadless Area Conservation Rule (36 CFR Part 294) identifies characteristics including high-quality undisturbed soil, water, and air; sources of public drinking water; diversity of plant and animal communities; habitat for threatened, endangered, proposed, candidate and sensitive species, and for those species dependent upon large undisturbed areas of land; motorized and semi primitive classes of recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified characteristics. It includes prohibitions on road construction and reconstruction, and timber cutting, sale, or removal. Any proposed management activities require a thorough review of potential effects to the roadless characteristics. Continuing to manage these areas as IRAs at this time provides desirable flexibility to address issues in these areas (Walker Mountain – barrier to protect Gila chub, vegetation treatment; East Clear Creek – removal of aquatic invasive species to protect Little Colorado River spinedace and vegetation treatment; Barbershop - removal of aquatic invasive species to protect Little Colorado River spinedace) while continuing to manage them for their roadless character. Under this management approach, these three areas would likely be more capable of providing wilderness values in the future with fewer invasive species and forest structure that better resembles the desired conditions.

After applying these three steps, the remaining PWAs were Strawberry Crater, Abineau, and Davey's. After approving this review process and considering the outcome, the Forest Supervisor and the Regional Forester agreed that alternative B should be modified to make the Strawberry Crater, Abineau, and Davey's PWAs the recommended wilderness areas. To reflect this change, alternative B is now referred to as alternative B (modified). Alternative C remains unchanged and still recommends Strawberry Crater, Abineau, and Davey's, as well as the 10 other PWAs. The effects of the wilderness recommendations

under alternatives B (modified) and C are analyzed in the environmental impact statement. Alternatives A and D still have no recommended wilderness areas.

The effects of not including any recommended wilderness areas in alternatives A and D are analyzed in the environmental impact statement.

Concern Statement #322: The Forest Plan should protect large blocks of intact and undeveloped land without recommending it for wilderness designation. Increasing wilderness acres as proposed in alternative C could have a significant adverse impact on those who enjoy motorized recreation, including wildlife viewing, hunting, geo-caching and other legal responsible uses. Problems with wildfire management, maintaining existing infrastructure for utilities, livestock and wildlife, Search and Rescue missions and other necessary activities could also suffer under alternative C. By comparison, alternative B would serve to identify some additional wilderness while not going overboard with alternative C. (71-4)

Response: The forest plan revision effort includes two alternatives that were analyzed in detail that do not propose any recommended wilderness areas. See alternatives A and D in the environmental impact statement. Furthermore, all of the alternatives include direction that protects large blocks of intact and undeveloped land on the Forest in ways other than making additional wilderness designations. There are nine inventoried roadless areas on the Forest totaling about 50,571 acres. Under all alternatives, these areas are managed to maintain their overall roadless character under all alternatives. See Inventoried Roadless Area section and map 2 in the Forest Plan for additional details on the existing inventoried roadless areas.

Likewise, all of the alternatives include direction that would support adjustments to the lands managed by the Forest to provide for a more undeveloped and contiguous land base. The Landownership Planning/Land Classification section in alternative A includes direction to consider acquiring and disposing of land to increase the undeveloped and contiguous nature of the Forest. See 1987 Plan, pages 84-88. Alternatives B (modified), C, and D include similar direction. For example, the Land Adjustments section expresses a desire for a mostly contiguous land base with a natural-appearing landscape that has not lost its wildland character. See FW-LndAdj-DC-1.

Furthermore, alternative C would only recommend new wilderness areas. Recommended wilderness is not the same as designated wilderness, which can only be designated by an act of Congress. Recommended wilderness allows for greater management flexibility and administrative use than designated wilderness. For example, the Plan recognizes that some recommended wilderness areas contain structures that may require maintenance and that new structures may be desirable. A Recommended Wilderness guideline acknowledges that existing structures may be maintained to maintain the area's wilderness character. The guideline notes that the maintenance should be carried out in a manner that does not expand the evidence of motor vehicle use beyond the current conditions. See SA-RWild-G-1. Another guideline addresses new structures in recommended wilderness areas. This guideline limits the construction of new structures unless the structure's presence and future maintenance can be carried out in a manner consistent with the area's wilderness character. See SA-RWild-G-2.

The Plan also addresses motor vehicle use in recommended wilderness areas. Rather than creating a complete prohibition on motor vehicle use in recommended wilderness areas, the Plan includes a guideline that states that motor vehicle use should only occur for limited administrative and permitted activities, and as defined on motor vehicle use (MVUM) and over snow vehicle (OSV) maps, to be consistent with the area's wilderness character. See SA-RWild-G-3. The inclusion of this guideline acknowledges that some level of motor vehicle use, including motorized big game retrieval as indicated on the approved MVUM, will be continuing in recommended wilderness areas.

Even if a recommended wilderness is ultimately designated as wilderness, the Forest still has quite a lot of flexibility to manage for wildlife (see Concern Statement #775), livestock grazing (see Congressional Grazing Guidelines in FSM 2323.22), and Search and Rescue missions.

Concern Statement #464: The Forest Plan should not manage wilderness areas solely as a recreation designation. (56-107)

Response: The Forest Plan provides direction in the Wilderness section that reflects both the ecological and social value of wilderness. The Forest Plan includes a variety of desired conditions for wilderness areas, including retention of primitive character, ecosystems and ecological resources that are functioning properly and reflecting natural processes, and ecosystems that are providing a variety of habitats that support species diversity. See SA-Wild-DC-1, 2, and 3. Disturbances, including fire and flooding, should be able to play their natural role. See SA-Wild-DC-4. All of the standards in the Wilderness section are designed to protect these desired wilderness conditions from potential impacts from recreational activities. See SA-Wild-S-1 through 5. All of the guidelines in the Wilderness section are designed, in whole or part, for the same purpose. See SA-Wild-G-1 through 11.

Concern Statement #465: The Recommended Wilderness Areas in the Forest Plan should not include existing utility corridors. (69-24, 69-42, 69-44, 69-47)

Response: Thank you for pointing out that some of the recommended wilderness areas appeared to include existing utility corridors, and we appreciate you sharing geospatial information on this topic. The boundaries for the Davey's Recommended Wilderness Area and the Deadwood Draw have been adjusted to ensure that they do not include existing adjacent utility corridors. The analysis on these recommended wilderness areas has been edited to conform with the adjusted boundaries. If these areas are designated as wilderness, the actual boundaries are determined at that time.

Concern Statement #468: The Forest Plan should include additional Recommended Wilderness Areas to meet the need for wilderness. (74-18)

Response: Need is one factor considered when evaluating potential wilderness areas, but no wilderness recommendation is based solely on the evaluation of need. Potential wilderness areas were also evaluated for availability and capability. For more information on how recommended wilderness areas were selected, see the response on the rationale for selecting the recommended wilderness areas included in the Forest Plan (see Concern Statement #265 in the Wilderness Resources section of this document).

Concern Statement #586: The Forest Plan should address motorized intrusions into designated wilderness areas. (75-187)

Response: The Forest Plan has been adjusted in response to this comment. The topic of motorized intrusions into wilderness areas is addressed by a desired condition that seeks effective boundary management. See SA-Wild-DC-6. Because motorized and mechanized intrusions would be problematic for any wilderness area, this desired condition has been written to apply to all wilderness areas on the Forest. Some of the information from the desired conditions has been converted into a guideline that requires barriers and signs along the Strawberry Crater Wilderness be designed to prevent motor vehicle intrusions. See SA-Wild-G-10.

Concern Statement #637: The Forest Plan should include direction to address visitor use and consider control measures for each wilderness area. (74-27)

Response: The Forest Plan contains direction to address visitor use and consider control measures in wilderness areas. As part of the reorganization of the Forest Plan, all plan components associated with designated wilderness areas have been grouped into a section in chapter 3 of the Forest Plan titled

Designated Wilderness Areas. Many of the plan components are designed to apply to every designated wilderness area, but some components indicate that they apply to a particular designated wilderness area.

The Designated Wilderness Areas section includes standards that limit group sizes in all wilderness areas to 12 persons and stock animals, and restrict commercial and organizational group activities to those activities that promote wilderness values. See SA-Wild-S-1 and 2. Several guidelines in this section also address visitor use. Permitted uses are to be designed to maintain or move toward the desired conditions for wilderness. See SA-Wild-G-1. Large group activities should not occur in wilderness areas in order to maintain visitor experiences consistent with Wilderness Opportunity Spectrum settings (such as solitude). See SA-Wild-G-3. The guidelines also indicate that use levels should be managed through permit systems or other methods when necessary to prevent wilderness values and opportunities from being compromised. See SA-Wild-G-2. Management approaches in the Designated Wilderness Areas section remind forest managers to:

> Closely monitor wilderness areas for overuse and unacceptable resource damage to identify when onsite management is needed.
>
> Use levels may be determined by limits of acceptable change studies, range analyses, code-a-site inventories, or professional judgment.

In addition to these components that apply to all designated wilderness areas, the Forest Plan contains direction that addresses concerns in particular wilderness areas. Standards in this section prohibit off-trail travel during snow-free periods, overnight camping, and use of recreational livestock such as horses, pack stock, mules, or llamas in the Alpine Tundra ERU portion of the Kachina Peaks Wilderness. See SA-Wild-S-3 and 4. Guidelines in this section indicate steps to take to discourage and reduce off-trail travel to protect alpine tundra vegetation in the Kachina Peaks Wilderness and to prevent motor vehicle intrusions into the Strawberry Crater Wilderness. See SA-Wild-G-9 and 10.

Wildfire, insect, and disease control measures are addressed through forestwide direction. A desired condition for wildland fires, wherever they may occur on the Forest, is to burn within the historic fire regime of the vegetation communities affected. High-severity fires occur where this is part of the historical fire regime and do not burn at the landscape scale. See FW-Fire-DC-2. Other desired conditions acknowledge that insects and disease can be agents of natural levels of disturbance in ecosystems. These desired conditions apply in designated wilderness areas as well as the rest of the Forest. For example, an All Ecosystems desired conditions seeks ecosystem conditions that promote endemic levels of disease. See FW-Eco-DC-4. Likewise, a Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) desired conditions seeks disease in caves and karst to be within natural levels. See FW-BioPhys-Geo-DC-3. Many of the Terrestrial ERUs included similar desired conditions for natural levels of disturbance, including insects and disease. See FW-TerrERU-AspMpl-DC-2; FW-TerrERU-PP-DC-2; FW-TerrERU-MC-MCFF-DC-4; FW-TerrERU-MC-MCIF-DC-4; and FW-TerrERU-SF-DC-1. A Springs guideline requires projects and activities to be designed to prevent the introduction or spread of disease and invasive or undesirable species. See FW-Rip-Spr-G-3.

Concern Statement #743: The Forest Service process to evaluate potential wilderness areas is flawed because it rates inventoried roadless areas as having high potential for wilderness, which then requires these areas to be managed as wilderness until Congress decides whether to designate the areas as wilderness. (48-18)

Response: The process for evaluating areas on the Coconino NF for wilderness potential is described in the Potential Wilderness Area Evaluation Report (USDA Forest Service 2016j). The Forest began the wilderness evaluation by conducting an inventory of all areas within the Coconino NF that satisfy the definition of wilderness found in section 2(c) of the 1964 Wilderness Act and meet the inventory criteria

from the Forest Service Handbook. Inventoried roadless areas, along with all other areas on the Forest, were considered during this process. Thirty-seven areas were identified through this inventory process.

Areas that meet the definition of wilderness mentioned above are then considered for capability, availability, and need in order to be deemed suitable for recommendation as wilderness. Capability is the degree to which an area contains the basic characteristics that make it suitable for wilderness recommendation without regard to its availability for or need as wilderness. The determination of availability is conditioned by the value of and need for the wilderness resource compared to the value of and need for other resources. The need for an area to be designated as wilderness is determined through an analysis of the degree to which it contributes to the overall National Wilderness Preservation System.

After the inventory process was complete, the Forest next considered the capability of these areas. As part of the evaluation process, a rating of high, medium, or low was applied to each area. The Forest used this part of the process to identify 15 areas to carry forward for evaluation for availability and need. Only five of the nine inventoried roadless areas on the Forest were included in this group.

After considering availability and need, the Forest identified three areas to be recommended wilderness areas to be included in alternative B (modified): Strawberry Crater, Abineau, and Davey's. None of these areas are inventoried roadless areas. Alternative C includes 13 recommended wilderness areas, which includes all or part of 5 inventoried roadless areas. The Forest Plan does provide more protective direction for areas that have been identified as recommended wilderness areas, although the management in these areas will not be as restrictive as if they were designated wilderness. See plan direction in the Recommended Wilderness and Designated Wilderness Areas section in chapter 3 of the Forest Plan. The direction for recommended wilderness areas would continue to apply until Congress decides whether to designate one or all of these areas as wilderness. If these areas are designated as wilderness, the plan direction for Designated Wilderness Areas would apply.

Concern Statement #745: The Forest Service should reconsider the Wilderness Needs Evaluation prepared for this forest plan revision effort. The Forest Service has other tools to address needs for wilderness-like settings, like semi-primitive non-motorized and primitive Recreation Opportunity Spectrum classifications. Furthermore, ranking areas that provide habitat connectivity, such as the Strawberry Crater Potential Wilderness Area, as high ignores the fact that designating the area as wilderness will make it difficult to address threats to that connectivity, such as juniper encroachment on grasslands. (48-17)

Response: The Wilderness Needs Evaluation prepared for this forest plan revision effort did consider how other areas with wilderness-like settings, such as semi-primitive non-motorized and primitive Recreation Opportunity Spectrum classifications, could meet the needs for unconfined outdoor recreation experiences. Factor #3 (out of 6) in the Wilderness Need Evaluation considers “the extent to which non-wilderness lands on the NFS [National Forest System] unit or other Federal lands are likely to provide for unconfined outdoor recreation experiences” by looking at lands with a semi-primitive non-motorized and primitive Recreation Opportunity Spectrum. This factor also considers inventoried roadless areas. The Wilderness Need Evaluation identified 168,546 acres of land within the Coconino NF and 3,382,377 acres of land within 100 miles of the Coconino NF that were included in one of these categories. Taking these areas with wilderness-like settings into account, the Wilderness Evaluation Report (USDA Forest Service 2016j) gave all the potential wilderness areas a “low” rating for Factor #3.

The commenter correctly notes that the Strawberry Crater Potential Wilderness Area was given a “high” rating under Factor #4, Item #2, which considers primitive conditions that provide benefits in terms of habitat connectivity. However, the importance of this rating is balanced against the other five factors that are used to evaluate wilderness need. Furthermore, the commenter’s concerns that wilderness designation

could make it difficult to address threats to habitat connectivity, such as juniper encroachment on grasslands, is addressed in a different part of the wilderness evaluation. The Wilderness Evaluation Report considers capability, availability, and need in order to determine if an area is suitable for recommendation as wilderness. The commenter's concern regarding limitations on management actions such as vegetation treatments is addressed in the rating for availability. The Strawberry Crater Potential Wilderness Area was given a rating of "medium" because, among other things, the area is need of vegetation treatments.

The Wilderness Evaluation Report describes how these ratings were used in determining whether to include a potential wilderness area as a recommended wilderness area in the proposed revised plan or an alternative analyzed in detail in the environmental impact statement.

Concern Statement #766: The Forest Service should consider how the recommended wilderness areas would create more and larger wilderness areas that would result in increased connectivity of habitat for top predators, better chance of survival for rare and endangered species, higher biodiversity, more watershed protection, closure and naturalization of existing roads, and a better wilderness experience for visitors. (11-4, 74-19)

Response: The Forest considered the potential effects of recommended wilderness areas in the environmental impact statement by considering the resources within the recommended wilderness areas and the condition of those resources. This approach allowed the Forest to analyze the potential impacts based on the resources that are present. However, to address some of the specific points raised in this comment, the environmental impact statement has been reviewed and adjusted when necessary.

Information on the potential effects of larger, more contiguous wilderness areas on top predators has been added to the Wildlife, Fish, and Plants section in chapter 3 of the environmental impact statement. The new information indicates that depending on the species, threats, and habitat requirements, larger and more wilderness may benefit top predators. The acreage of designated plus recommended wilderness areas is considerably higher in alternative C compared to other alternatives. The spatial arrangement of nine of these would result in mostly contiguous designated or recommended wilderness from the Wet Beaver Creek Wilderness south to the Matazal Wilderness. Generally, these wildernesses areas are rugged and have comparatively few roads and human disturbances.

Mountain lions are one of the top predators on the Forest. They would benefit from recommended wilderness primarily because of the relatively fewer miles of roads; the types of roads that generally occur in these rugged areas; the relatively low human disturbance; and the management toward primitive, undeveloped characteristics. See SA-RWild-DC-1, 2; and SA-RWild-G-1, 2, 3. If these areas are designated as wilderness, the area would continue to be managed for primitive characteristics and natural processes. See SA-Wild-DC-1, 2, and 3. Both recommended and designated wilderness would support a natural assemblage of native species. See SA-RWild-DC-3 and SA-Wild-DC-3. For recommended wilderness, human disturbances would largely be as a result of limited motorized administrative and permitted uses, mechanized (bike use) on designated trails, and the potential for motorized retrieval of elk under the 2011 Travel Management Rule decision. See FW-Rec-Trails-DC-11 and SA-RWild-G-3. About 10.6 miles of roads designated for public access on the current motor vehicle use map would be affected and these miles primarily occur in Black Mountain and Cedar Bench recommended wilderness with smaller amounts in Deadwood Draw, Tin Can, Cimmaron-Boulder, and Hackberry.

In designated wilderness, motorized and mechanized use would not be permitted. Other human disturbances would be mitigated with group size limits, permits, signs, cairns, and education. See SA-Wild-S-1, 2; SA-Wild-G-1, 2, 3, 5, 6, and 7. In addition, management approaches in designated wilderness would remind managers to monitor wilderness for over use, use levels, trespass and intrusions, and to utilize patrols, partnerships, and volunteers to assist with wilderness management.

Mountain lions and their prey species would also benefit from the rugged terrain and diverse vegetation in these wildernesses. Lions tend to select for rough terrain, forest, woodland or chaparral cover, lower road densities, and avoidance of human disturbance (Mattson 2007, Nicholson et al. 2014, Van Dyke et al. 1986 a and b). Mountain lions have large home ranges that range from about 13,000 to 207,000 acres for resident males, and about 7,000 to nearly 54,000 acres for resident females (Nicholson et al. 2014) so that large areas with the above characteristics would be suitable habitat. Lions most frequently crossed unimproved dirt roads, the type most likely to be found in recommended wilderness areas, so barriers to movement would likely be low (Van Dyke 1986b). The rough terrain and vegetation types would exist regardless of wilderness recommendation.

Mexican gray wolves are another key predator that were historically present on the Forest and one that has been reintroduced in the White Mountains of Arizona. Recent regulations allow Mexican wolves to naturally disperse and occupy an area of the Forest south of I-40 that is bounded by I-17, Highway 87, and Highway 260. Key ecological conditions for the Mexican gray wolf are large area size, adequate prey, and security from human exploitation (illegal shooting, vehicular collisions). Recommended wilderness areas would provide these key ecological conditions. Similar to mountain lions, Mexican wolves would benefit from these recommendations primarily because of the relatively fewer miles of roads; the types of roads that generally occur in these rugged areas; the relatively low human disturbance; and the management toward primitive, undeveloped characteristics. These characteristics would likely remain the same whether these areas were designated or not because of the inherent ruggedness of the areas and some of the recommended wildernesses overlap inventoried roadless areas.

Information on the potential effects of larger, more contiguous wilderness areas on the protection or higher survival for rare species has been added to the Wildlife, Fish, and Plants section in chapter 3 of the environmental impact statement. Protection or higher survival for rare species depends on species habitat requirements, threats, and overlap with wilderness areas. The Biological Assessment indicates that standards and guidelines specific to wilderness generally pertain to recreation management and should generally be beneficial to protecting habitat for listed aquatic species. Desired conditions include the preservation of native species, which would be beneficial. Combined with forestwide guidance, wilderness-specific guidance is generally positive for Chiricahua leopard frogs, Mexican spotted owls, and Mexican wolves (particularly management of roads that provide access into wolf areas).

It is not known if the wildernesses recommended in alternative C contain or would protect higher biodiversity than if the areas were not recommended. This is because the methods used to identify areas as recommended wilderness did not emphasize species richness or the number of endemic species (both potential indicators of biodiversity) as primary criteria. It is also compounded by the fact that species are unevenly distributed and high species richness may not correlate with large numbers of endemic species (Lamoreux et al. 2006).

The 1987 Forest Plan is being revised under the 1982 Planning Rule. Recommended wilderness areas were identified under the 1982 Planning Rule using a process outlined in FSH 1909.12 Chapter 70 (effective date January 31, 2007). Recommended wilderness areas also need to meet the definition of wilderness found in section 2 of the 1964 Wilderness Act. Criteria for recommended wilderness include inventory, capability, availability, and need. For more information, see the Potential Wilderness Area Evaluation Report (USDA Forest Service 2016j), which is available on the Coconino NF's website at: http://www.fs.usda.gov/project/?project=32780.

The Special Areas analysis in the Riparian section of chapter 3 of the environmental impact statement acknowledges that closure and naturalization of existing roads would reduce riparian destruction, erosion, and sediment delivery into streams, which collectively decreases riparian fragmentation. However, these recommended areas are not expected to offer additional protection of soil, water quality, or watershed

function because the location of riparian is already inaccessible to human disturbance in most cases. Streams in the East Clear Creek and Barbershop recommended wildernesses would benefit from this recommendation.

The Special Areas analysis in the Recreation section in chapter 3 of the environmental impact statement acknowledges that alternative C would add 91,757 acres (less than 1 percent of the forest) to current wilderness management. Although the arrangement of these recommended wildernesses relative to each other has not been analyzed, the environmental impact statement acknowledges that this alternative would provide the greatest increase in the opportunities for wilderness experience and the largest variety of new wilderness opportunities on the forest. Recommending these areas as wilderness would limit access to these areas for motorized and mechanical recreation, which would be displaced to other areas on the forest. Hunting and scouting would be non-motorized in recommended wilderness, which would result in reduced hunting access for individuals who are mobility-impaired. Motorized elk big game retrieval would continue to occur until congressionally designated as wilderness. A substantial portion of these areas have terrain that is not passable by vehicle, and even though big game retrieval might be allowed, it is unlikely to occur.

Concern Statement #296: The Forest Service should adjust the boundaries on the Strawberry Crater, Davey's, and Hackberry potential wilderness areas to remove existing utility corridors. (43-9, 43-11)

Response: The boundaries on the Strawberry Crater, Davey's, and Hackberry potential wilderness areas (PWAs) have been adjusted to ensure that they do not overlap the rights-of-way for these existing power lines. The boundary adjustments were very small and did not affect the evaluations of these PWAs. The Strawberry Crater PWA was reduced from 6,611 acres to 6,579 acres. The Davey's PWA was reduced from 1,779 acres to 1,739 acres. The Hackberry PWA was reduced from 26,044 acres to 25,836 acres.

Concern Statement #593: The Forest Plan should require social encounters to be consistent with the Recreation Opportunity Spectrum settings for the Kachina Peaks Wilderness. (56-90)

Response: There are provisions in the Designated Wilderness Areas section of the Forest Plan to maintain or protect wilderness and cultural values in the Kachina Peaks Wilderness. These include limiting group size, restricting overnight camping and recreational livestock use above tree line, and managing use levels through permit systems or other methods. See SA-Wild-S-1, 4; SA-Wild-G-1, 2, 3.

Concern Statement #775: The Forest Service should not recommend any new wilderness areas because recommendation and designation can reduce access for wildlife-oriented recreation, affect the Arizona Game and Fish Department's ability to achieve big game harvest objectives through regulated hunting, and when combined with restrictions on motorized big game retrieval, may unfairly limit participation of the physically challenged. The Department has also found that management actions needed for wildlife population/habitat management are often prohibited outright in proposed or designated wilderness, or effectively precluded by complex and inefficient layers of bureaucratic process.

Response: As part of the forest plan revision process, the forest has identified three areas (totaling 8,733 acres) that will be managed as recommended wilderness: Abineau, Strawberry Crater, and Davey's. The forest acknowledges that designated and recommended wilderness areas have additional administrative obligations that have the potential to impact management options. These potential impacts, however, do not negate the forest's obligation to determine whether to recommend any suitable lands for wilderness designation. See 36 CFR 219.7(c)(2)(v). The process used to identify the recommended wilderness areas is described above in response to Comment #265.

Recommended wilderness is not the same as designated wilderness, which can only be designated by an act of Congress. Recommended wilderness allows for greater management flexibility and administrative use than designated wilderness. For example, the Plan recognizes that some recommended wilderness areas contain structures that may require maintenance and that new structures may be desirable. A Recommended Wilderness guideline acknowledges that existing structures may be maintained to maintain the area's wilderness character. The guideline notes that the maintenance should be carried out in a manner that does not expand the evidence of motor vehicle use beyond the current conditions. See SA-RWild-G-1. Another guideline addresses new structures in recommended wilderness areas. This guideline limits the construction of new structures unless the structure's presence and future maintenance can be carried out in a manner consistent with the area's wilderness character. See SA-RWild-G-2.

The Plan also addresses motor vehicle use in recommended wilderness areas. Rather than creating a complete prohibition on motor vehicle use in recommended wilderness areas, the Plan includes a guideline that states that motor vehicle use should only occur for limited administrative and permitted activities, and as defined on motor vehicle use (MVUM) and over snow vehicle (OSV) maps, to be consistent with the area's wilderness character. See SA-RWild-G-3. The inclusion of this guideline acknowledges that some level of motor vehicle use, including motorized big game retrieval as indicated on the approved MVUM, will be continuing in recommended wilderness areas.

The Recommended Wilderness section in the Forest Plan also includes a management approach that suggests that forest managers can use, but does not require, a minimum requirement analysis as a framework to evaluate the potential effects of a project on the area's wilderness character.

For lands that have been designated as wilderness, the Association of Fish and Wildlife Agencies, the Bureau of Land Management, and the Forest Service have developed policies and guidelines to clarify fish and wildlife management in wilderness (AFWA 2006). As with other law, regulation, and policy, the Forest Plan does not repeat this direction. However, the AFWA policies and guidelines are referenced in the Wildlife, Fish, and Plants and Designated Wilderness Areas sections in appendix D of the Forest Plan.

The AFWA policies and guidelines address the use of motorized equipment in wilderness. For example, the AFWA policies and guidelines recognize that states' fish and wildlife management activities within wilderness can be accomplished with motor vehicles, motorized equipment, or mechanical transport, but only if these devices are necessary to meet the minimum requirements for the administration of the area as wilderness or are specifically permitted by other provisions of the Act. See AFWA 2006, Section F. 1. A Minimum Requirements Decision Process would be applied to determine if the use of motorized equipment is necessary.

The AFWA policies and guidelines also address facility development and habitat alteration in wilderness. See AFWA 2006, Section F. 4. Among other things, this section acknowledges that "facility development and habitat alteration may be necessary to alleviate adverse impacts caused by human activities on fish and wildlife, including human/wildlife conflicts, and to conserve fish and wildlife resources in wilderness." These policies and guidelines note that maintenance of existing water supplies and development of additional water supplies, including wildlife water developments, which would involve uses generally prohibited under Sec. 4 (c) of the Wilderness Act will be considered by the Forest Service and the Bureau of Land Management. A Minimum Requirements Decision Process would be applied to determine if facility development or habitat alteration within designate wilderness is necessary.

Wildlife, Fish, and Plants

Concern Statement #223: The Forest Plan should include plan components that protect listed and sensitive species and ensure species viability. Specifically, the Forest Plan should include:

- **a standard requiring implementation of recovery plans for threatened and endangered species,**
- **standards and guidelines from recovery plans for threatened and endangered species, such as the Mexican spotted owl,**
- **standards and guidelines to protect northern goshawk,**
- **guidelines to ensure native fish viability, and**
- **components to ensure pronghorn viability.**

(56-2, 56-3, 56-5, 64-51, 74-51, 84-15, 84-16, 84-19, 84-20, 84-21, 84-22, 84-23, 84-74, 84-97, 84-105, 110-2)

Response: A coarse filter (habitat) and fine filter (species needs) approach was used in the Forest Plan to ensure species viability. Tables 3, 4, and 5 in Volume 2 of the Final Environmental Impact Statement identify the primary habitat and special feature association for each of the forest planning species that were analyzed. Ecosystem management of these primary habitats and special features is designed to maintain them or move them toward desired conditions. This will be beneficial for all of the species associated with those habits and special features. These tables also identify the fine filter threats, if any, for each of the forest planning species. The FEIS includes discussion and analysis on each of the primary habitats and special features, explaining the effects of the various alternatives on these coarse filter habitats. If no fine filter threat is identified, the FEIS includes discussion and analysis for each of the coarse filter species, either individually or in groups that share similar habitats. If a fine filter threat is identified, the FEIS includes discussion and analysis by species or groups of plan components that are designed to address those threats to these fine filter species. Additional information can be found in the Wildlife, Fish and Plant section in chapter 3 of the Final Environmental Impact Statement, which describes the coarse filter/ fine filter approach in greater detail, compares the four alternatives in terms of viability, and identifies the specific plan components that are intended to protect at-risk species and maintain or improve the resiliency and sustainability of their associated habitats.

These plan components include desired conditions that define desirable and necessary habitat, standards and guidelines that protect habitat and species, and management approaches that suggest management techniques and opportunities that are beneficial to species.

As examples, some of these plan components apply to broad groups of species:

- The Wildlife, Fish, and Plant section has desired conditions to support sustainable populations of native plant and animal species; properly functioning ecosystems; maintenance of species diversity and metapopulations; and interconnected habitat. See FW-WFP-1 to 9. There are two standards in the section on Wildlife, Fish, and Plants that would protect listed, proposed, or candidate species as well as eagles. See FW-WFP-S-1 and 2.
- There are a number of guidelines specific to species as well. To improve the status of species and prevent Federal listing, management activities should comply with species conservation agreements, assessments, strategies, or national guidelines. For example, FW-WFP-G-2. Other guidelines (FW-WFP-G-8 and 9) provide timing restrictions for sensitive species and minimal fire suppression techniques for both federally listed and sensitive species. Other protections for sensitive and endemic species, raptors, and amphibians occur in FW-WFP-G-10, 11 and 12.

- There are numerous desired conditions and guidelines that are designed to maintain, protect, or enhance the habitat. These are located in each individual Terrestrial ERU and in Watersheds and Water, Constructed Waters, Riparian Areas, Livestock Grazing, Mineral Resources, Roads, Special Uses, and various management areas.
- Numerous guidelines would maintain or protect habitat for aquatic species and those associated with riparian habitats. See FW-Rip-All-G-2, 3; FW-Rip-Strm-G-1, 2; FW-Rip-Spr-G-1 to 4; and FW-Rip-RipType-G-1 to 4. Guidelines in the Invasive Species section would also improve and protect native species habitat. See FW-Invas-DC-1; and FW-Invas-G-1 and 2.

Other plan components target specific species and their habitats. For example:

- Mexican spotted owl - The Forest Plan includes guidelines that require adherence to approved recovery plans, species conservation agreements, assessments, strategies, or national guidelines. See FW-WFP-G-1 and 2. By referencing these types of documents, instead of listing specific direction from these documents in the Forest Plan, the Forest Plan will be able to remain current with these documents as they are revised over time. The Forest Plan would not contain outdated direction. Mexican spotted owls are specifically mentioned in FW-TerrERU-PP-DC-1, 7, 13; FW-TerrERU-MC-All-DC-1, 3; and FW-TerrERU-MC-MCFF-DC-11. Dwarf mistletoe and oak, which are nest and roost sites for owls, as well as valuable for other wildlife species, are specifically mentioned in FW-TerrERU-PP-DC-2, 9, 14; and FW-TerrERU-MC-MCFF-DC-4, 12.
- Northern goshawk – The Forest Plan specifically addresses northern goshawks in several areas. See FW-TerrERU-PP-DC-1, 3, and 12; FW-TerrERU-MC-All-DC-1, 4; FW-TerrERU-MC-MCFF-DC-5, 9; FW-TerrERU-MC-MCIF-DC-8; FW-TerrERU-SF-DC-10; and FW-TerrERU-WFP-G-14.
- Pronghorn - The Forest Plan includes a variety of plan components that specifically address potential impacts and threats to pronghorn. The Constructed Waters section includes a desired condition for earthen stock ponds and wildlife waters to be accessible to wildlife, especially during key periods, such as pronghorn fawning or during times of stress such as drought. See FW-ConstWat-DC-2. The Grassland Ecological Response Units section describes vegetation conditions that would be beneficial for pronghorn. See FW-TerrERU-Grass-DC-4 and 8. Management approaches in the Grassland Ecological Response Unit section remind forest managers to:

  > Coordinate with Arizona Game and Fish Department (AZGFD) and U.S. Fish and Wildlife Service on objectives for wildlife conservation, education, habitat restoration, and improvements, particularly regarding pronghorn, prairie dogs, and black-footed ferrets.
  >
  > and that:
  >
  > Species-specific wildlife needs are addressed on a site-specific basis and considered during project-level planning and implementation. For example, where they occur, pronghorn typically benefit from grasses and shrubs greater than 11 inches in height to provide fawns protection from predators during the fawning season (AZGFD 2011b). This habitat consideration is, however, dependent in large part on weather and site capability. Optimal fawning habitat conditions may not always be achievable due to variable environmental conditions (such as winter snowfall and spring precipitation). Project specialists work together to determine achievable conditions that would optimize wildlife habitat at the site level, and give consideration to follow-up monitoring that could assess how well such conditions have been met.

- Finally, guidelines in the Wildlife, Fish, and Plants section require projects and developments to be designed to provide for safe passage and to have appropriate timing restrictions related to pronghorn. See FW-WFP-G-5, 6, and 8.

The Forest Plan also minimizes duplication of law, regulation, and policy and has an appendix that includes laws, regulations, Forest Service policy and/or direction, and references best management practices and useful, current science at the time of writing of the revised plan.

Concern Statement #698: The Forest Service should clarify that one of the elements common to all alternatives is to provide and maintain healthy fish and wildlife populations. (75-132)

Response: No change has been made in the Forest Plan in response to this comment. The concept of healthy fish and wildlife populations is embedded in desired conditions for wildlife, fish, and plants. These desired conditions support sustainable populations of native plant and animal species, properly functioning ecosystems and habitat that provide necessary physical and biological habitat components for the needs of associated native species, and keeping common species common. See FW-WFP-DC-1 to 5. In addition, guidelines would prevent or reduce the likelihood of introduction or spread of disease. See FW-WFP-G-3 and 12. Finally, there are desired conditions that promote that invasive species be managed so as to be absent or at levels that do not affect sustainability of native and desirable non-native species; do not disrupt the natural fire regime; and do not disrupt ecological composition, structure, and function. See FW-Invas-DC-1 and G-1.

Concern Statement #489: The Forest Plan should require suites of species to be surveyed to identify trends in ecosystems. (56-7)

Response: Surveying suites of species is one way to identify trends in ecosystems. The Monitoring Strategy and Plan included in chapter 5 of the Forest Plan was developed to address the Forest's obligation to conduct monitoring under the 1982 Planning Rule provisions, while considering Forest staffing and budget levels over the life of the Forest Plan. Whenever possible and appropriate, the Forest has sought to use existing data collection efforts to answer the monitoring questions, which is intended to reduce the cost (both in dollars and in personnel) for monitoring. These existing data are used to answer monitoring questions that can also identify trends in ecosystems rather than creating a new surveying requirement that is not within the foreseeable budget for the Forest. For example, the Monitoring Plan uses the Forest Activity Tracking System (FACTS) database to identify the acres treated in each ERU to determine if management activities have contributed to maintaining or making progress toward desired conditions related to vegetation structure for the Semi-desert Grassland and Pinyon Juniper with Grass ERUs. See monitoring question #3 in table 15 in the Forest Plan.

Concern Statement #758: The Forest Service should provide information on how the population of all species has changed over time and provide proof that human interference in the forest affects (either positively or negatively) or has affected the plants, fish, and animals of the forest. (55-2)

Response: Providing information on how the population of all species has changed over time is outside the scope of the forest plan revision effort; however, detailed information for forest planning species is located in the environmental impact statement, including conservation status and an estimate of occupied and suitable habitat. The purpose of the forest plan revision effort is to update the Forest Plan where needed, considering new or changed conditions, outdated or missing guidance, ongoing challenges, and input from employees and external stakeholders. To that end, the Forest assessed the threats and risks to numerous forest planning species and their habitat as part of this forest plan revision effort, with a focus on uses and activities under the authority of the Forest Service. See the Ecological Sustainability Report (USDA Forest Service 2009a) and the Analysis of the Management Situation (2010) for additional information on forest planning species and their threats. The findings from these documents were then incorporated into the forest plan revision process as part of the Needs for Change identified in chapter 1 of the environmental impact statement. The phrase “Human interference” was not specifically used in these documents, however, similar language was used. The intent was to be more specific regarding

identification of threats (such as disturbance during the breeding season) when possible so links between species or habitat threats and Forest Plan language would be clearer.

The consequences of how well plan language in the different alternatives addresses threats to plants, fish, and animals and their habitat are discussed in the environmental impact statement and the underlying specialist reports and assessments prepared during the forest plan revision effort. The sources of information used in the preparation of these documents are cited and referenced as is appropriate for these documents.

Concern Statement #533: The Forest Plan should include objectives that benefit wildlife and fish species other than those identified as threatened, endangered, or sensitive. (75-94)

Response: No change has been made to the Forest Plan in response to this comment. While two of the objectives focus on threatened, endangered, and sensitive species, actions taken in pursuit of these objectives could also be beneficial for other wildlife and fish species. See FW-WFP-O-1 and 2. Two other objectives seek to restore or enhance areas of terrestrial wildlife and stream habitat, which could be beneficial for other wildlife and fish species. See FW-WFP-O-3 and 4. Objectives associated with the various ERUs may also benefit wildlife species. Site-specific NEPA would be done in an interdisciplinary fashion before implementing those objectives, and wildlife, fish, and plant input would be incorporated in the final decision before objective implementation. Finally, forest restoration activities are not limited to those listed in the objectives, so other restoration actions can be undertaken as opportunities arise.

Concern Statement #341: The Forest Plan should include stronger direction to increase chances of survival for young wildlife, active roosts, nests, and dens. (85-19)

Response: The Forest Plan has been adjusted in response to this comment. This plan component has been moved to the Wildlife, Fish, and Plants section and combined with other plan direction related to disturbance to wildlife. Timing restrictions in the Forest Plan specifically apply to federally listed species, golden eagles, bald eagles, Southwestern Region sensitive species, and pronghorn to promote recovery, preclude listing, and to address pronghorn for which there have been population concerns over the years. See FW-WFP-S-2 and FW-WFP-G-8. In addition, the Geological Features (formerly Caves, Karst, Cliffs, and Talus Slope) section has a guideline that requires that caves and abandoned mines be managed to protect bats from disturbance. See FW-BioPhys-Geo-6. Caves can be used by bats during sensitive time periods such as raising their young or hibernating when they are particularly sensitive to disturbance; or caves can be used by bats roosting in colonies such that a relatively large number of bats could be disturbed by one disturbance.

The Forest Plan is intended to give managers flexibility in how species and their habitat are protected, maintained, and enhanced. The Forest Plan does not preclude managers from using timing restrictions as a means to achieve or move toward desired conditions in the Forest Plan, such as to keep common species common and to maintain or improve habitat for species populations and their habitat over the long term. See FW-WFP-DC-2 and 8. Although not specifically prescribed, timing restrictions could also be used as a tool to maintain or improve habitat for native species; protect raptors from disturbance; or to protect or provide for narrowly endemic species, or those with restricted distributions. See FW-WFP-G-3, 10, and 11.

Concern Statement #281: The Forest Service should coordinate with other State and Federal agencies when developing plan components for sensitive species in the Forest Plan as required by the 1982 Planning Rule. (74-52)

Response: The Coconino NF has coordinated with the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department during the development of the Forest Plan.

Concern Statement #366: The Forest Plan should include the pronghorn protections contained in the current plan, including the grassland guidance from Management Area 27 of the current forest plan, to protect pronghorn populations and emphasize pronghorn habitat. (56-54, 56-100, 64-36)

Response: The Forest Plan has been modified in response to this comment. The current plan and the revised Forest Plan have similar plan components for pronghorn except in many cases, the direction has been expanded to forestwide in the revised Forest Plan. Both plans:

- have pronghorn as a management indicator species for grassland. See 1987 Plan, pages 158, 162, 166; Monitoring Question #20 of revised plan.
- have guidelines to promote safe access to water and safe passage through fences. See 1987 Plan, page 69, 206-51; FW-WFP-DC-5, 6, and FW-ConstWat-DC-2.
- promote open structure in grasslands and an understory mix that provides food and cover for pronghorn except the direction in the revised Forest Plan applies forestwide instead of being limited to Management Area 27 in the current plan. See 1987 Plan, page 206-50; FW-TerrERU-Grass-DC-4 and 8.
- improve and expand pronghorn habitat except the revised Forest Plan has objectives for improving habitat forestwide instead of only one management area. See 1987 Plan, pages 168, 206-5; FW-TerrERU-Grass-O-2, 3, and 5.
- would design new road and trail locations to meet species life history requirements, maintain access to adjoining habitat, and maintain habitat for dispersal and migration. The revised Forest Plan direction is forestwide. See 1987 Plan, pages 206-50, 206-53; FW-WFP-G-6 and 13.

Both plans would coordinate with Arizona Game and Fish Department on hunting recommendations except the management approach in the revised Forest Plan in the section on Wildlife, Fish, and Plants applies forestwide:

> Coordinate with the Arizona Game and Fish Department regarding the State Wildlife Action Plan as well as hunting recommendations for various wildlife populations that would lead to maintenance and improvement of habitat elements such as vegetation, aspen, riparian, and soil condition and productivity.

The revised Forest Plan would promote pronghorn survival and successful reproduction through timing restrictions forestwide. It also has desired conditions for the Anderson Mesa Management Area that promote sustainable pronghorn populations that can move freely and easily access winter range. See FW-WFP-G-8; MA-AMesa-DC-1, 3.

Concern Statement #696: The Forest Plan should include a desired condition to achieve a pronghorn ratio of 40 fawns per 100 does. (64-32)

Response: No change to the Forest Plan has been made in response to this comment. The management authority for pronghorn is vested by law with the Arizona Game and Fish Department. Fawn to doe ratios (fawn:doe) are set by Arizona Game and Fish Department and are outside of the Forest Service mission. The Forest Service cooperates with Arizona Game and Fish Department on the management of pronghorn and pronghorn habitat.

Concern Statement #736: The Forest Service should identify grassland juniper as a risk factor for pronghorn because there is a desired condition for openings between trees for All Pinyon Juniper Types (see Draft Revised Plan FW-Veg-PJ-All-DC-2) to be connected to provide sufficient sighting distance to facilitate pronghorn movement. (24-2)

Response: The Draft Environmental Impact Statement acknowledged that the invasion of juniper and shrub species into grasslands is a risk factor for pronghorn. See page 274 of Volume I of the Draft Environmental Impact Statement. This information was not in the Supplemental Wildlife Viability Report dated November 2013. However, as noted in the Preface of the Supplemental Wildlife Viability Report, the information and analysis for pronghorn is included in its entirety in the Draft Environmental Impact Statement, whereas the Supplemental Wildlife Viability Report contains additional information that is not in the Draft Environmental Impact Statement. The acknowledgement of this risk factor is being carried forward into the Final Environmental Impact Statement and the Wildlife Viability Report (USDA Forest Service 2017b).

This risk factor also continues to be addressed by the Forest Plan. The concept connectivity of habitat has been expanded to apply to more than just the Pinyon Juniper ERUs. This concept is now expressed in the All Terrestrial ERUs section in a desired condition for vegetation and stream ecosystems to be connected based on natural patterns. See FW-TerrERU-All-DC-3. A guideline in the Wildlife, Fish, and Plants section also addresses this topic by requiring importation wildlife movement corridors and pronghorn habitat to be generally free of impediments to movement. See FW-WFP-G-6.

Concern Statement #409: The Forest Plan should not rely on the habitat-proxy approach to ensure species viability, but instead should use estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. The distribution of habitat needs to be better articulated in the analysis. The type of habitat, quality and quantity of habitat needed by individual species needs be better supported. Cumulative effects over space and time, including competition of non-native species and habitat conditions on non-federal lands needs to be included. (56-1, 84-26, 84-27, 84-29, 84-30, 84-107)

Response: The analysis of species viability was conducted as directed in accordance with National Forest Management Act (36 CFR § 219.19) that defines a viable population as:

> "one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning areas."

The Act goes on to say:

> "In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with each other."

This species viability analysis is not population viability analysis, which is the probability of a population persisting for a biologically meaningful timeframe and which often seeks to identify a minimum number of individuals for population persistence.

Because National Forest Management Act regulations require providing habitat for species viability within the planning area, focus of this evaluation is on habitat provided on National Forest System land. Surrounding private lands may contribute to, or hinder, maintenance of species viability on National Forest System land, but are not relied upon to meet regulation requirements. For this reason, habitat abundance was assessed based on conditions found on National Forest System land. Habitat distribution, however, was assessed considering the condition of intermixed ownerships and conditions, which may affect the interactions of species among suitable habitat patches on National Forest System lands.

Additional information has been added to the Final Environmental Impact Statement to better articulate the analysis of species viability.

In evaluating species viability, a coarse filter/fine filter approach was used. Each evaluated species was associated with its primary habitat (the coarse filter), which could be an ERU or riparian area, and primary threats to the habitat were identified. This was based on known species locations, consultation with species experts, and/ or literature review. An estimation was made as to the amount of occupied habitat as well as the amount of potentially suitable habitat for each species. Each species was described as to its known rarity and species with restricted ranges were identified. Threats to the habitat constitute a threat to the species. The quality and quantity of the habitat was summarized based on findings in the reports from other specialists such as the Vegetation Report (USDA Forest Service 2016a), Soil Report (USDA Forest Service 2016g), and Riparian Report (USDA Forest Service 2016h), or from other professional sources. Fine filter species-specific threats (such as disease) were also identified. This coarse filter/fine filter process was used to help develop and refine desired conditions, standards, and guidelines for the revised plan. Species-specific plan direction was developed where needed for threats which the Forest Service could impact through management and for which the Forest Service has jurisdictional control. Management approaches were generally developed to address threats for which the Forest Service does not have complete jurisdiction. However, the coarse filter/fine filter approach does not assume that habitats are a proxy for viability, nor is the viability analysis process a habitat proxy. In addition, there is no National Forest Management Act requirement to spatially demonstrate adequate habitat for each species, and the Vegetation Dynamics Development Tool (VDDT) modeling is not spatially explicit.

Other wildlife specialist reports assessed some of these species relative to requirements based on their status (e.g., federally listed, Southwestern Region sensitive species, management indicator species, etc.). For example, federally listed species were also analyzed in a biological assessment to comply with the Endangered Species Act and Forest Service policy.

Cumulative effects, including non-native species and conditions on non-National Forest System lands, are considered as part of the viability analysis. Habitat distribution and quality is considered in species viability analysis as one of the primary steps in viability assessment. Habitat distribution considers the condition of intermixed ownerships and conditions, which may affect the interactions of species among suitable habitat areas on national forest lands. Lands in other ownership within or surrounding the Forest may contribute to, or hinder, maintenance of species viability on national forest land. Invasive non-native exotic species are identified as threats for several species including lowland leopard frogs and northern leopard frogs. These threats are addressed in the analysis and also included as part of a cumulative effects analysis. For example, the cumulative effects section for northern leopard frogs acknowledges that external factors such as decreasing precipitation and aquifer recharge from climate change, and decreased recharge from groundwater pumping in nearby communities could degrade habitat quality of the riparian habitat and negatively influence viability regardless of management effects. Invasive or non-native species on lands in other ownerships, such as crayfish or bullfrogs, can prey on or compete with this species or degrade this species habitat resulting in less hiding cover for eggs and tadpoles, lowering reproductive success, and reducing the size or number of populations.

Concern Statement #419: The Forest Plan should not broadly prohibit the transfer of aquatic species between watersheds because it is unduly restrictive of management authority vested in the Arizona Department of Game and Fish. (75-95)

Response: This guideline has been removed from the Forest Plan as suggested by the commenter. The concern regarding habitat for and transfer of aquatic species is appropriately addressed in other plan

components. See FW-WFP-DC-1, FW-WFP-G-3, FW-Invas-G-1, and two management approaches in the Invasive Species section, which remind forest managers to:

> Coordinate with stakeholders and the public to reduce, minimize, or eliminate the potential introduction, establishment, spread, and impact of non-native invasive species and to monitor the effectiveness of project design features.
>
> Encourage the prevention of accidental introduction and spread of invasive species carried by contaminated vehicles, equipment, personnel, or materials (including plants, wood, plant/wood products, water, soil, rock, sand, gravel, mulch, seeds, grain, hay, straw, animal feeds, or other materials).

Concern Statement #538: The Forest Plan should recognize that some barriers to movement by aquatic species can be desirable to protect native aquatic species, or can be harmful and that barrier removal should be evaluated. (75-87)

Response: The Forest Plan has been adjusted in response to this comment. The topic of situational desirability of barriers in streams to restrict passage of aquatic species that can be harmful to native aquatic species is addressed in a separate desired condition in the Wildlife, Fish, and Plants section. See FW-WFP-DC-9. A management approach in Wildlife, Fish, and Plants has been adjusted to remind managers to coordinate with agencies regarding the establishment or removal of fish barriers. It reads:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Concern Statement #548: The Forest Plan should address disease and non-native fish to meet the Forest's obligations under the Endangered Species Act and other laws, as well as desired conditions, standards, objectives, guidelines, and management practices that relate to species, water quality, recreational uses that relate to threats to native fish. (74-53, 75-96)

Response: The Forest Plan addresses the native fish species and the concerns related to disease and non-native species through a variety of strategic and specific plan components. Broad plan components describing desired habitat conditions, including the presence of non-native fish and disease have been included in the All Ecosystems section. See FW-Eco-DC-1 and 4. Desired conditions in the All Riparian, Streams, and Springs sections seek to provide habitat for all species on the Forest. See FW-Rip-All-DC-3, FW-Rip-Strm-DC-2, and FW-Rip-Spr-DC-5. The Wildlife, Fish, and Plants section includes additional direction on desired habitat conditions, including habitat for species listed under the Endangered Species Act and aquatic species. See FW-WFP-DC-1, 2, 3, 4, and 6. Consistency with these desired conditions is required when implementing decisions under the Forest Plan. See the Future Projects, Program Plans, and Assessments section in chapter 1 of the Forest Plan. A variety of guidelines throughout the Forest Plan require projects and activities to be designed and managed to maintain or move toward these desired conditions.

The Forest Plan places an emphasis on native species, addressing them in many plan components. For example, see FW-Eco-DC-1 and 4; FW-Water-DC-6; FW-Water-G-6; FW-Rip-Strm-G-1; FW-Rip-Wtlnds-DC-1 and 2; FW-Rip-Spr-DC-2; FW-Rip-Spr-G-3; FW-Rip-RipType-DC-2 and 6; FW-Rip-

RipType-G-2; FW-WFP-DC-1, 2, 3, 4, 9, and 10; FW-WFP-G-3; FW-Invas-DC-1; FW-Invas-G-1 and 2; FW-Graz-G-7; FW-RdsFac-G-9; FW-Rec-Dev-G-2; and FW-Scenic-DC-1.

The Forest Plan also contains plan components that address non-native species. The Forest Plan recognizes that some non-native species may be present and in balance with properly functioning ecosystems. See FW-Eco-DC-4. A Wildlife, Fish, and Plants component recognizes that barriers to passage can be desirable to physically separate native and non-native species. See FW-WFP-DC-9. A Wildlife, Fish, and Plants management approach reminds forest managers to:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Several components also address the management of invasive species for the benefit of native species. See FW-Invas-DC-1. A management approach in the Invasive Species section reminds forest managers to:

> Coordinate with stakeholders and the public to reduce, minimize, or eliminate the potential introduction, establishment, spread, and impact of non-native invasive species and to monitor the effectiveness of project design features.

Finally, the management of disease in aquatic systems is addressed in several guidelines. See FW-Rip-Spr-G-3; FW-WFP-G-3 and 12.

Concern Statement #613: The Forest Plan should require coordination with the Arizona Department of Game and Fish prior to the removal or mitigation of any aquatic barriers. (75-88)

Response: The Forest Plan is, by design, strategic in nature and does not identify the removal or mitigation of any particular aquatic barrier on the Forest. Removal or mitigation of a specific aquatic barrier is a project-level decision that would be made based on site-specific information and analysis, and therefore, is not a forest plan-level decision. However, the Forest Plan addresses this concern through a management approach that reminds forest managers to:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Concern Statement #616: The Forest Plan should adjust the Dispersed Recreation management approach relating to cooperation with the Arizona Game and Fish Department on the stocking of fish to emphasize the use of native fish in stocking efforts. (56-200)

Response: The Forest Plan has been adjusted in response to this comment. The management approach from the Dispersed Recreation section mentioned in the comment has been divided into two management approaches. One of the management approaches was moved to the All Recreation section. It addresses coordination for fishing access and reminds forest managers to:

> Coordinate with the Arizona Game and Fish Department to provide fishing access to meet goals and objectives of the Department's fisheries plans.

The topic relating to the stocking of fish (including native fish) is addressed in a forestwide Wildlife, Fish, and Plants management approach, which reminds forest managers to:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Concern Statement #417: The Forest Plan should have plan components specifically related to the management of ponderosa pine forest structure that contributes to nesting, fledging and foraging habitat for northern goshawk. (84-25)

Response: Northern goshawks and structure specific to their foraging areas, nesting areas, and post-fledging areas is incorporated into the desired conditions for the Ponderosa Pine, Mixed Conifer Frequent Fire, Mixed Conifer with Infrequent Fire, and Spruce Fir ERUs and a guideline in the Wildlife, Fish, and Plants section. See FW-TerrERU-PP-DC-12; FW-TerrERU-MC-MCFF-DC-9; FW-TerrERU-MC-MCIF-DC-8; FW-TerrERU-SF-DC-10; and FW-WFP-G-14.

Concern Statement #443: The Forest Plan should clearly identify the management prescriptions that will be applied to recreation events in northern goshawk habitat to ensure consistent application. (67-4)

Response: The Forest Plan has not been adjusted to create particular management prescriptions that would be applied to all recreation events that occur in northern goshawk habitat. The Forest Plan is designed to provide strategic guidance for project-level decisions that involve recreation events and northern goshawk habitat. For example, the Wildlife, Fish, and Plants section includes a standard that requires timing restrictions on projects and activities that have the potential to negatively affect federally listed species, bald eagles, and golden eagles. See FW-WFP-S-2. A Wildlife, Fish, and Plants guideline includes a similar requirement for Southwestern Region sensitive species (which includes northern goshawks) and pronghorn. See FW-WFP-G-8. A management approach to the Wildlife, Fish, and Plants section of the revised Plan provides additional clarity for these components. It reminds forest managers that:

> The application of timing restrictions, like those referenced in FW-WFP-S-2 and FW-WFP-G-8, will be based on site-specific information and may vary depending on variables such as species, weather, timing of activity relative to species life cycle, or duration, frequency, and type of activities that are occurring in the species' habitat. Other variables to be considered could include the duration, extent, and intensity of the proposed activity, or the type of activity itself, such as emergency or safety-related actions versus non-emergency activities. The best available information and science is utilized to develop timing restrictions to reduce impacts to disturbance sensitive species.

Accordingly, the identification of a specific timing restriction is made at the project level based on site-specific information related to the project or activity (including the timing, duration, extent, and intensity of the proposed activity) and how it relates to the species in question. The best available information and science would be used to develop timing restrictions to reduce impacts to and disturbance of sensitive

species. Some literature suggests that recreation disturbance can negatively impact reproductive success in northern goshawks such as Morrison and others (2011), Kruger (2002), and Gaines et al (2003).

Concern Statement #721: The Forest Service should provide documentation to support the assertion that Mexican spotted owl's population is stable. (46-1, 84-32)

Response: The Wildlife, Fish, and Plants section in chapter 3 of the environmental impact statement includes information on the Existing Condition Population Trend for Mexican spotted owl. Two sources were used to determine the population trend for the Mexican spotted owl. The information sources include an article by Seamans et al. published in the journal *Conservation Biology* in 1999 and information in the Management Indicator Species Status Report for the Coconino National Forest completed in 2013 (USDA Forest Service 2013a). Based on this information, the existing condition population trend may "stable to declining." The environmental impact statement has been updated to acknowledge the population monitoring currently being conducted by the Southwestern Region of the Forest Service.

The Wildlife, Fish, and Plants section considers the effects of the different alternatives on the population trend. Based on the projected improvement in habitat, combined with implementation of other aspects of the recovery plan, the population trend should improve from "stable to declining" to "stable" under all alternatives.

Concern Statement #639: The Forest Service should develop and analyze an alternative that focuses on Mexican spotted owl and its critical habitat. The alternative should: (1) implement existing standards and guidelines from the current plan, (2) limit new road construction in protected activity centers (PACs), (3) incorporate fuel treatment concepts to minimize risk of stand-replacing fire in PACs including large tree retention, management of surface fuels and sub-canopy forest structure, and spatial orientation of treatments, and (4) apply fuel treatment modeling in Mexican spotted owl habitat conducted by Northern Arizona University Forest Ecosystem Restoration Analysis. (84-24)

Response: Alternative A in the environmental impact statement retains plan direction from the 1987 plan and focuses on Mexican spotted owl and its critical habitat, as suggested in the comment. The analysis of alternative A considered implementation of existing standards and guidelines from the current plan; limiting new road construction in protected activity centers; large tree retention; and management of surface fuels and sub-canopy forest structure to minimize risk of stand-replacing fire in PACs.

Methodologies for fuel treatment modeling and spatial orientation of treatments would be determined by the responsible official on a site-specific basis. The Northern Arizona University Forest Ecosystem Restoration Analysis may be used, if determined applicable.

Concern Statement #420: The Wildlife, Fish, and Plants guideline related to use of pesticides, insecticides, or other chemicals near bat roosting, foraging, or watering areas (see Draft Revised Plan FW-WFP-G-12) should be deleted and replaced with a statement to follow Best Management Practices. (75-98)

Response: This guideline has been adjusted in response to this comment to clarify its intent and scope of application. As adjusted, the guideline focuses more on directing projects to consider the potential negative impacts of pesticides, herbicides, or chemicals to species and their habitat. See FW-WFP-G-4.

Concern Statement #421: The Forest Plan should adjust the Wildlife, Fish, and Plants desired condition that addresses human-made or altered habitats (see Draft Revised Plan FW-WFP-DC-1) to recognize the role of management intervention to meet conservation objectives. (75-85)

In FN-Wfp-Dc1 (pp 72-73) the last sentence seems to indicate that all human-made habitat alterations may be removed from the CNF in time. We hope this is in reference to non-permanent structures. We request this be re-written so as to define what is to be removed. (77-9, 94-9)

Response: This desired condition has been adjusted in response to the comments. One of the purposes of the component is to recognize that human-made or altered habitats may be needed to support species populations or meet long-term population goals. The desired condition has been adjusted to clarify this purpose. See FW-WFP-DC-8.

Concern Statement #423: The Forest Plan should recognize that elk provide significant cultural value, consumptive and nonconsumptive recreation, intrinsic value, significant economic benefit to local communities and businesses, and generate a significant source of revenue for the Department that is used for conservation of wildlife, including nongame species. (75-101)

Response: The Forest Plan recognizes the value of elk to forest users. The Wildlife, Fish, and Plants section includes a desired condition that characterizes elk as a charismatic species that residents and visitors appreciate and have ample opportunities to experience. See FW-WFP-DC-10. The General Description and Background for the Wildlife, Fish, and Plants section recognizes that people enjoy the wildlife on the Forest for a variety of reasons and acknowledges that elk are one of the nine big game species that occur on the Forest.

Concern Statement #424: The Forest Plan should not refer to elk as a non-native species. (75-100, 77-10, 86-44, 94-10)

Response: The desired condition has been adjusted in response to these comments. Elk are no longer referenced as a desirable non-native species and are no longer mentioned in the Invasive Species section. See FW-Invas-DC-1.

Concern Statement #633: The Forest Plan should identify elk as a focal species that serves as a surrogate for early seral dependent birds and mammals. (77-1)

Response: The Coconino Forest Plan is under the 1982 Rule provision which does not reference focal species. Focal species are an aspect of the 2012 Planning Rule. See 36 CFR Part 219.12 (a) (5) (iii).

Concern Statement #635: The Forest Plan should increase the amount of early seral vegetation in the Pinyon Juniper with Grass, Pinyon Juniper Evergreen Shrub, Ponderosa Pine, and Mixed Conifer with Frequent Fire ERUs to improve forage for elk. (77-2)

Response: The seral stages listed in the tables that were included in the desired conditions for the Pinyon Juniper with Grass, Pinyon Juniper Evergreen Shrub, Ponderosa Pine, and Mixed Conifer with Frequent Fire ERUs are intended to represent the desired proportion of seral stages of these ERUs at the forest scale. The proportions were not adjusted in response to these comments. This table (along with similar tables included in the plan direction for other ERUs) has been moved to appendix E of the Plan and the tables are now identified as tables 16, 17, 18, and 19. The Introduction for appendix E explains that seral stage proportions for modeled states should be assessed at the scale of the entire ERU within a Forest boundary or greater. Collectively, the table plus the more detailed text in the plan comprise the desired conditions. Seral stage proportions are rarely, if ever, applied at the project level. Because these seral stages only apply at these very broad scales, they should not conflict with variations in seral stages that are associated with natural disturbance regimes observed at the project level.

The desired condition is to have characteristic fire sustain predominantly open pinyon juniper, ponderosa pine, and mixed conifer frequent fire ERUs. Predominantly open conditions would support herbaceous plants, properly functioning soil, natural disturbance regimes, and all-aged vegetation structure. See FW-TerrERU-PP-DC-2, 3, 4, 8, 10, and 13.

Concern Statement #751: The Forest Service should analyze the impact of the imported elk on the vegetation and native wildlife on the Coconino NF. (55-4)

Response: Although the elk that is currently present in northern Arizona is not the native sub-species, it is still the same species as the Rocky Mountain elk. The effects associated with elk are described in the environmental impact statement, as appropriate. For example, elk are acknowledged as one of the impacts that is resulting in Montane Willow Riparian Forest being departed from desired condition. Elk are also acknowledged for their impacts to the habitat for species such as Little Colorado spinedace. Additional information on the potential effects of elk on the vegetation and other wildlife on the Coconino NF can be found in the environmental impact statement.

Concern Statement #227: The Forest Plan should make reintroduction of Gunnison's prairie dog a priority. (64-37)

Response: The Forest Plan does not make a decision about the reintroduction of Gunnison's prairie dog. Decisions regarding reintroduction of wildlife species are made by the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service. The Forest Plan does, however, include direction that will be beneficial for prairie dog. Desired conditions in the Grassland Ecological Response Units section promotes open, connected, and properly functioning grasslands and recognizes the prairie dog's role in influencing vegetation density and vegetation mosaic. See FW-TerrERU-Grass-DC-1, 2, 3, 8. Two grassland objectives would restore or enhance prairie dog habitat and a guideline would enhance vegetation and soil productivity in grasslands. See FW-TerrERU-Grass-O-2, 3; FW-TerrERU-Grass-G-2. A desired condition in Wildlife, Fish and Plants maintains and improves habitat for native species and a guideline encourages measures to prevent or reduce the likelihood of disease (a major threat to prairie dogs). See FW-WFP-DC-1; FW-WFP-G-3. A management approach in the Grassland Ecological Response Units section emphasizes coordination with Arizona Game and Fish Department and the U.S. Fish and Wildlife Service particularly for grassland species, such as prairie dogs. It states:

> Coordinate with Arizona Game and Fish Department (AZGFD) and U.S. Fish and Wildlife Service on objectives for wildlife conservation, education, habitat restoration, and improvements, particularly regarding pronghorn, prairie dogs, and black-footed ferrets.

Management approaches in Wildlife, Fish, and Plants remind managers to:

> Use current literature and the best available science when making site-specific decisions relevant to project planning. This is done in an interdisciplinary context with input from other resource specialists. For example; the guideline specifying disturbance buffers around raptor nests (FW-WFP-G-11) is intended as a minimum buffer. Some raptor species (such as osprey) are more adapted to disturbance and are likely to tolerate a buffer of just 300 yards during the breeding season while other, less tolerant species (such as peregrine falcons (*Falco peregrinus*)) may require buffers of up to one-half mile. Wildlife biologists work with other resource specialists to identify and define the appropriate site-specific buffers (within the context of plan guidance) for other raptors on a case-by-case basis.
>
> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Concern Statement #529: The desired conditions in the Wildlife, Fish, and Plants section of the Forest Plan that discuss high-quality hunting and fishing opportunities and opportunities for residents and visitor to experience and learn about the Forest's wildlife, fish, and plant resources should be rewritten as management approaches. (56-193)

Response: The Forest Plan has been adjusted in response to this comment. The Wildlife, Fish, and Plants desired condition relating to the Forest being known for high-quality hunting and fishing opportunities has been removed because the concepts were redundant of other plan components or were merged with other plan components. See FW-Rec-Disp-DC-5 and FW-WFP-DC-10. A management approach in the Wildlife, Fish, and Plants section reminds forest managers to coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for native species and the management of sport and native fishes, including the identification of refugia for native fish. It states:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

The Wildlife, Fish, and Plants desired condition relating to residents and visitors having ample opportunities to experience, appreciate, and learn about the forest's wildlife, fish, and plant resources has been retained, but additional guidance has been added. See FW-WFP-DC-10. As worded, this component properly expresses desired conditions, so it has not been converted to a management approach.

Concern Statement #532: To better protect amphibian populations, the Forest Plan should replace the Wildlife, Fish and Plants guideline that states that established protocols should be followed to prevent the introduction and spread of a chytrid fungus (*Batrachochytrium dendrobatidis*) (see Draft Revised Plan FW-WFP-G-7) with a standard that mandates compliance with established protocols to prevent the introduction and spread of a chytrid fungus. (74-73)

Response: The Forest Plan has been adjusted in response to this comment. This guideline was not converted to a standard as suggested, but like standards, compliance with guidelines is required unless the intent of the guideline can be met in another way. Deviation from the explicit provisions of a guideline, if it is meeting the intent of the guideline, must be documented in the project record. See description of Guidelines in the Plan Content section in chapter 1 of the Forest Plan.

The guideline has been adjusted to have broader application on the spread of disease, while listing chytrid fungus as an example. See FW-WFP-G-12. The Wildlife, Fish, and Plants section also includes a management approach that reminds forest managers to:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Concern Statement #534: The Forest Plan should provide direction for new or reconstructed fences to be designed to facilitate the movement of wildlife and prevent injury to wildlife. (56-102, 58-9, 64-35, 75-97)

Response: The guideline related to construction for wildlife-friendly fences has been retained with slight editorial adjustments to improve its clarity. See FW-WFP-G-6. Another guideline has been added to the Wildlife, Fish, and Plants section that requires structural improvements to be planned and managed to provide wildlife with safe use of water and to allow safe passage. See FW-WFP-G-5. These guidelines would be applicable to any new decisions on fence construction and/or modification of existing fencing. In addition, a sentence has been added to a management approach in Wildlife, Fish, and Plants to remind managers to reference current agency recommendations for improving wildlife habitat. It reads:

> Coordinate with the Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and the statewide Native Fish Conservation Team regarding maintenance of habitat for listed and native species; reintroductions, introductions, or transplants of species; control or eradication of non-native species; and the management of sport and native fishes, including the identification of refugia for native fish and the establishment or removal of fish barriers. Coordination includes referencing current agency recommendations for improving wildlife habitat such as guidelines for wildlife-friendly fencing.

Concern Statement #690: The Forest Service should provide additional detail on the corridors identified by the Arizona Department of Game and Fish of concentrated wildlife habitat critical to the migratory patterns of multiple species that have been identified in a wildlife connectivity assessment. Furthermore, the Draft Environmental Statement incorrectly states that the Department has an office in Yavapai County. (75-152)

Response: In the Forest Plan, the General Description and Background in the section on Wildlife, Fish, and Plants specifically mentions some existing wildlife movement corridors within the forest boundary. A management approach reminds managers to:

> Work with the Arizona Game and Fish Department, Arizona Department of Transportation, Arizona Wildlife Linkages Working Group, and others to identify linkages and barriers to wildlife movements and to mitigate such threats during project design.

The environmental impact statement has been adjusted in response to this comment. The Wildlife, Fish, and Plant section in chapter 3 of the environmental impact statement has a discussion about wildlife movement corridors. The reference to a Yavapai County office for the Arizona Department of Game and Fish has been removed.

Concern Statement #535: The Forest Plan should include bald eagles in list of species to be protected by direction on timing restrictions. (86-43)

Response: The Forest Plan has been adjusted in response to this comment. Bald eagles have been added to the list of species identified in this component. To provide a more clear direction for listed species, bald eagles and golden eagles, part of this plan component has been converted into a standard. See FW-WFP-S-2.

Concern Statement #537: The Forest Plan should include a list of desirable non-native species. (75-83)

Response: The Forest Plan has been adjusted in response to this comment. A list of desirable non-native species has not been added to the Forest Plan, but a definition for the term “desirable non-native species”

has been added to the Glossary. It acknowledges that these species have high positive social or economic value.

Concern Statement #557: The Forest Plan should recognize that some utility actions of a hazardous or emergency nature cannot be conducted within timing restriction parameters mentioned in Draft Revised Plan's guideline FW-WFP-G-4. (69-12)

Response: This guideline has been adjusted to refer to "timing restrictions" instead of "seasonal timing restrictions." This change provides greater flexibility for projects to design timing restrictions based on site-specific information, such as the activity and species involved. For example, depending on the activity and potentially impacted species, a restriction on activities during a particular time of day may be sufficient instead of a restriction on an entire season. This guideline has also been adjusted to provide greater protection for listed species. This was achieved by separating the guideline into a standard that addresses listed species and a guideline that applies to Southwestern Region sensitive species and pronghorn. See FW-WFP-S-2 and FW-WFP-G-8.

A management approach has been added to the Wildlife, Fish, and Plants section to remind forest managers that:

> The application of timing restrictions, like those referenced in FW-WFP-S-2 and FW-WFP-G-8, will be based on site-specific information and may vary depending on variables such as species, weather, timing of activity relative to species life cycle, or duration, frequency, and type of activities that are occurring in the species' habitat. Other variables to be considered could include the duration, extent, and intensity of the proposed activity, or the type of activity itself, such as emergency or safety-related actions versus non-emergency activities. The best available information and science is utilized to develop timing restrictions to reduce impacts to disturbance sensitive species.

Despite these changes, the application of timing restrictions would still occur on a site-specific basis.

Concern Statement #704: The Forest Service should acknowledge that the Coconino NF will soon be determined essential for the full recovery of the endangered Mexican wolf. (56-194)

Response: In 2015, after the distribution of the Draft Environmental Impact Statement, the U.S. Fish and Wildlife Service (USFWS) published a Final Rule that revised the geographic area and regulations for the experimental population (U.S. Fish and Wildlife Service 2015). The 2015 Final Rule identifies the Mexican Wolf Experimental Area (MWEPA) in portions of Arizona and New Mexico. Within the MWEPA, three zones are defined. All of the Coconino National Forest south of I-40 is within Zone 2 of the MWEPA. Within Zone 2, Mexican wolves are allowed to naturally disperse into and occupy, and translocations of wolves may occur.

The USFWS is implementing a phased approach to the management of wolves within the MWEPA in western Arizona. Phase 1 will be implemented for five years (which began on February 17, 2015). Relative to the Forest in Zone 2, this allows for natural dispersal and occupancy onto the Forest, but only on the portion bounded by I-40 on the north, Highway 87 on the east, Highway 260 on the south, and I-17 on the west. Translocations will not occur during Phase 1 onto that portion of the Forest, but could be allowed on the portion of the Forest east of Highway 87. If determined to be necessary after a 5-year review, Phase 2 would be implemented. On the Forest, natural dispersal and occupancy would be allowed throughout the Forest (south of I-40), but translocations would not be allowed west of I-17. If Phase 3 is initiated later, both natural dispersal and translocations would be allowed on the Forest south of I-40. Given that a large portion of the Coconino lies within the expanded MWEPA in the 2015 Rule, it is reasonable to expect there to be an increasing presence of transitory and resident Mexican wolves on the Forest over the course of the Forest Plan.

This new information has been incorporated into the analysis in the Wildlife, Fish, and Plant section in chapter 3 of the Final Environmental Impact Statement.

Concern Statement #720: The Forest Service should adjust the analysis related to new power lines and transmission corridors in areas that could contain roosting, nesting or foraging habitat for bald and golden eagles. The analysis in the Golden and Bald Eagles section in the Draft Environmental Impact Statement suggests that new power lines and transmission corridors would not occur in areas that could contain roosting, nesting or foraging habitat for bald and golden eagles. It is for new transmission lines to be sited to avoid known eagle roosts. (43-8, 69-46, 82-26)

Response: No change has been made in response to this concern. The Coconino NF acknowledges that it is standard practice for new transmission lines to be sited to avoid known eagle roosts while siting a new transmission line. However, the point of the analysis in Golden and Bald Eagles section in the environmental impact statement that raised these concerns is not about avoiding eagle roosts or foraging habitat. Rather, the analysis is suggesting that the plan component that seeks to have new utility corridors avoid research natural areas, geological and botanical areas, and environmental study areas would be beneficial to any roosting, nesting or foraging habitat for bald and golden eagles in those areas. The Forest Plan still contains a guideline that would require new utility corridors to avoid these areas. See FW-SpecUse-G-10.

Concern Statement #726: The Forest Service should clarify or remove the management approach in alternative C that mentions specific management areas for bears. (75-154)

Response: No change has been made in response to this comment. Alternative C includes a management approach that reminds forest managers that:

> Areas managed for old growth, bear, and *Mexican* spotted owls *should be* the same.

This management approach is part of alternative A (the 1987 forest plan). It has been carried forward into alternative C as part of that alternative's proposal to retain the old growth direction from the 1987 forest plan. The management approach is designed to remind forest managers that bears and Mexican spotted owls use areas with old-growth components as habitat. This management approach suggests that when a project involves old growth, bear habitat, and/or Mexican spotted owl habitat, these resources be addressed in overlapping areas when possible, not in discrete and separate areas. The management approach is not intended to suggest that specific management areas need to be created for old growth, bear, or Mexican spotted owl. That would be a plan decision, not a suggestion included in a management approach.

Concern Statement #733: The Forest Service should acknowledge that the Arizona Department of Game and Fish is only responsible for populations of big game species. (64-49)

Response: No change has been made in response to this comment. The Arizona Department of Game and Fish is charged with management authority of both game and nongame wildlife species in the state of Arizona.

Concern Statement #737: The Forest Service should provide documentation for the assertion that dispersed recreation activities such as hiking and camping, camping in developed campgrounds, and motorized travel can disturb the western yellow-billed cuckoo during its breeding season. (35-1, 37-1)

Response: In response to this comment, the Final Rule to list the western yellow-billed cuckoo was reviewed to verify the statements in the Draft Environmental Impact Statement that dispersed recreation activities such as hiking and camping, camping in developed campgrounds, and motorized travel can disturb the species during the breeding season.

According to the Final Rule published by the USFWS, recreation activities can pose threats to proposed critical habitat for this species (USFWS 2014). These threats include recreation in the form of off-highway vehicle use within the riparian zone, habitat degradation from recreation activities, and destruction of riparian habitat by uncontrolled wildfires caused by recreation activities. In the Wildlife, Fish, and Plant section in chapter 3 of the environmental impact statement, recreation has been removed as a fine filter threat to the species on the forest. USFWS identified recreational shooting as an activity that can affect the species, but not to the level of being a threat to its continued existence. This section has also been adjusted to discuss the potential impacts of recreation to individual cuckoos or breeding pairs (rather than the species on the Forest as a whole). The environmental impact statement also discusses the impacts of recreation (and other threats) to habitat for this species.

Concern Statement #739: The Forest Service should revise information provided on the California floater and should not indicate that invasive animal species are a threat to the host fish. (37-2)

Response: No change to the environmental impact statement was made in response to this comment. The life cycle of California floaters includes a parasitic larval stage during which it is dependent upon a host fish, usually a member of the Gila genus, for food and dispersal. The Xerces Society focuses on conservation of invertebrates, not vertebrates like the host fish. The environmental impact statement states in several locations that threats to Gila species include predation by, and competition with invasive animals, as well as parasites and diseases introduced via non-native aquatic species. Gila species include headwater chub, roundtail chub, and Gila chub. References used include U.S. Department of Interior Fish and Wildlife Service 2005b and 2011b in the References section of the environmental impact statement.

Concern Statement #418: The Forest Plan should include an objective to complement the guideline in the Wildlife, Fish, and Plants section of the Forest Plan that addresses seasonal timing restrictions for a variety of species (see Draft Revised Plan, FW-WFP-G-4). The objective should provide concise, time-specific statements of measurable results, such as, "Within three (3) years of plan approval, implement seasonal timing restrictions for threatened, endangered, and sensitive species; bats; and Golden eagles to protect known nests, roosts, and other special features from habitat alteration and/or disturbance from management activities to avoid disruption of species or their habitats that could affect survival or successful reproduction." (74-71)

Response: No change has been made to the Forest Plan in response to this comment. This guideline has been separated into a standard that addresses timing restrictions for federally listed species, bald eagles, and golden eagles (FW-WFP-S-2) and Southwestern Region sensitive species and pronghorn (FW-WFP-G-8). These plan components will be applied immediately to projects and activities developed under the revised Forest Plan. Complementing these plan components with an objective as suggested could actually dilute its effectiveness by allowing up to 3 years for implementation.

Concern Statement #25: In the revised plan, the Forest Service should add "riparian" or "riparian habitat" to desired conditions in the section on Wildlife, Fish, and Plants because of the importance of this habitat to wildlife. (85-35)

Response: Several of the desired conditions in the Wildlife, Fish, and Plants section have been edited to address your suggestion that there should be more explicit references to riparian habitat. FW-WFP-DC-3 specifically mentions riparian areas and the necessary physical and biological habitat components that they provide. A desired condition related to riparian habitat in the Stream subsection of the former Water Quality, Water Quantity, and Aquatic Systems section has been moved to the Wildlife, Fish, and Plants section. See FW-WFP-DC-4. Finally, information related to habitat associated with stream ecosystems that was located in another desired condition in the Stream subsection of the former Water Quality, Water

Quantity, and Aquatic Systems section has been moved to the Wildlife, Fish, and Plants section and combined with one of the previous desired conditions in that section. See FW-WFP-DC-6.

Concern Statement #23: In the revised plan, the Forest Service should provide an example of an action in the objectives in the Wildlife, Fish, and Plant section. See FW-WFP-O-1 in the Draft Revised Plan. (85-36)

Response: The language in the Wildlife, Fish, and Plants objective (FW-WFP-O-1) has been adjusted in response to your suggestion to provide an example of an "action." The following sentence has been added to the objective: "An example of an activity could be thinning a Mexican spotted owl protected activity center to reduce the risk of uncharacteristic fire and to improve habitat conditions for prey species."

Concern Statement #224: The General Description and Background for Wildlife, Fish, and Plants section in the Forest Plan should be corrected to note that desert sucker is listed as "other," and not as a sport fish in the Arizona Game and Fish Department regulations. Also, headwater chub, a native sport fish, also occurs in Fossil Creek. (75-84)

Response: The General Description and Background for the Wildlife, Fish, and Plants section of the Forest Plan has been adjusted in response to your comment. Desert chub are no longer included in the discussion of "sport fish" and the presence of headwater chub in Fossil Creek has been acknowledged.

Concern Statement #225: The Forest Plan should combine several Wildlife, Fish, and Plan desired conditions (see Draft Revised Plan FW-WFP-DC-6 and 7) because these components are redundant. (75-86)

Response: These desired conditions have been merged in response to this comment. See FW-WFP-DC-6.

Concern Statement #244: The Forest Plan should clarify if the guideline in the Wildlife, Fish, and Plants section that recommends right-of-way fences to be located 1/8 mile from roads (see Draft Revised Plan, FW-WFP-G-10) applies to existing or upgraded roads even if right-of-way easements are not wide enough to allow for this distance. Would a plan amendment still be required if this guideline could not be met? (83-4)

Response: This guideline has been reworded to remove the one-eighth mile distance and allow for site-specific designs that allow safe passage for wildlife prone to movement restrictions. See FW-WFP-G-5.

Concern Statement #354: The General Description and Background in the Wildlife, Fish, and Plants section of the Forest Plan should be adjusted by inserting "primarily" before "dependent,", i.e., species are primarily dependent…as some species with adequate habitat (grey wolf, northern leopard frog, etc.,) may have healthy habitat but are persecuted or subjected to disease, or other non-habitat factors. (85-33)

Response: General Description and Background for the Wildlife, Fish, and Plants section has been edited as suggested.

Concern Statement #356: The Wildlife, Fish, and Plants section in the Forest Plan should include a management approach that specifically mentions coordinating/collaboration with Arizona Game and Fish Department on the implementation of the State Wildlife Action Plan. These plans apply to the management and conservation of wildlife on all jurisdictions, private and public. (85-37)

Response: A management approach in the Wildlife, Fish, and Plants section has been adjusted in response to this comment. It states:

> Coordinate with the Arizona Game and Fish Department regarding the State Wildlife Action Plan as well as hunting recommendations for various wildlife populations that would lead to

maintenance and improvement of habitat elements such as vegetation, aspen, riparian, and soil condition and productivity.

References for Appendix D

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Commenter Codes

The following table displays a list of commenter codes with the associated commenter name and organization. Each unique letter was assigned a commenter code. There are seven form letters (letters that have the same content submitted by multiple commenters) listed in the table.

Commenter Code	Commenter	Organization
1	Michael Boyle	
2	Ray Wells	
3	Matthew Crozier	Audubon Society
4	Andrea Guerrette	
5	Kim McClure (form letter 1)	Sierra Club
6	Bella Donna	Beaver Creek Trails Coalition
8	Bella Donna	Beaver Creek Trails Coalition
9	Michael Boyle	
11	Kathy Flaccus	
13	Eugenia Sullivan	
14	Ilona Anderson	Great Old Broads for Wilderness
17	Paul Sullivan	
18	Evert Bondurant	
19	William Kusner	
20	Evert Bondurant	
21	Evert Bondurant	
22	Evert Bondurant	
23	Evert Bondurant	
24	Evert Bondurant	
25	Evert Bondurant	
26	Evert Bondurant	
27	Emma Benenati	
30	Tricia Egger Anon	
32	Evert Bondurant	
33	Evert Bondurant	
34	Evert Bondurant	
35	Evert Bondurant	
37	Evert Bondurant	
40	Jacob Fillion	
43	Sean Heath	Western Area Power Administration
44	Doug Tolleson	University of Arizona
45	Evert Bondurant	
46	Evert Bondurant	
47	Dorothy O'Brien	
48	Steve Clark	Arizona Elk Society
49	Jim Unmacht	Arizona Sportsmen for Wildlife Conservation
50	Berta Benally	
51	Patrick Headington	
52	Cynthia Lovely	City of Sedona
53	Clayson Benally	

Commenter Code	Commenter	Organization
55	Evert Bondurant	
56	Alicyn Gitlin	Sierra Club, Grand Canyon Chapter
	Jay Lininger	Center for Biological Diversity
	Katherine Davis	Center for Biological Diversity
	Bryan Bird	WildEarth Guardians
	Marilyn J. Weissman	Friends of Flagstaff's Future
	Moran Henn	Friends of Flagstaff's Future
	Sarah King	Arizona Ecumenical Council Earth Care Commission
	Ilona Anderson	Flagstaff Broadband, Great Old Broads for Wilderness
	Ursula Wallentine	Flagstaff Broadband, Great Old Broads for Wilderness
	Shelley Silbert	National Office, Great Old Broads for Wilderness
	Matthew Crozier	Northern Arizona Audubon Society
	Rev. Doug Bland	Arizona Interfaith Power and Light
	Kelly Burke	Grand Canyon Wildlands Council
	Barbara Hawke	Arizona Wilderness Coalition
	Daniel Patterson	Public Employees for Environmental Responsibility
	Emil J. Renn	Grand Canyon Wolf Recovery Project
57	Daniel Taylor	Bat Conservation International
58	Judy Prosser	The Diablo Trust
	Bob Prosser	Bar T Bar Ranch, Inc.
	James Park	Coconino Cattle Growers
	Dan Bell	Arizona Cattlegrowers' Association
	Kit Metzger	Flying M Ranch
59	Jim Driscoll	Coconino County Sheriff's Office
60	John Mullen	
61	Ralph Baierlein	
62	Victoria Carella	Arizona State Land Department
63	Christina Vojta	Landscape Conservation Initiative, Northern Arizona University
64	Rick Erman	Friends of Anderson Mesa
65	Bruce Greco	Ecological Restoration Institute, Northern Arizona University
66	Tom Bean	
67	Anthony Quintile	Flagstaff Biking Organization
68	Thomas Thurman	Yavapai County
69	Ryan Jagels	Arizona Public Service
70	Erik Murdock	Access Fund
71	Tom Mackin	
72	Patrick Kell	International Mountain Biking Association
73	Susan Recce	National Rifle Association
74	Tom O'Halleran	Keep Sedona Beautiful
75	Laura Canaca	Arizona Game and Fish Department
76	Mark Altaha	White Mountain Apache Tribe
77	Blake Henning	Rocky Mountain Elk Foundation
78	Daniel Folke	City of Flagstaff
79	Lloyd Barnett	

Commenter Code	Commenter	Organization
80	Ray Keeler	
81	Erik Ryberg	Western Watersheds Project
82	Ruth Valencia	Salt River Project
83	Todd Williams	Arizona Department of Transportation
84	Jay Lininger	Center for Biological Diversity
85	Dan Taylor	Bat Conservation International
86	Patricia Sanderson Port	U.S. Department of Interior (USFWS and NPS)
87	Joe Shannon	
88	Tony Joe	The Navajo Nation
89	Dennis and Janet Aniol	
90	J.R. Murray	Arizona Snowbowl
91	Janet Aniol	Beaver Creek Preservation and Historical Society
92	Steve Nelson	Big Parkk Regional Coordinating Council
93	John Bradshaw	
94	Tom Britt	
95	Kathleen Martyn Goforth	U.S. Environmental Protection Agency, Region IX
96	Jim Bowser	Lake Montezuma Property Owners Association
97	Paul Smith	Red Rock Jeep Tours
98	Bill Ryker	
99	Bill Stafford	
100	Debra Galbraith	Town of Payson
101	Annie Jackson	
102	Joan McClelland	
103	Belle Starr	
104	Christine Lombardi	
105	Heather Luettjohann	
106	Tamara Nieto	
107	Elizabeth Richter	
108	James Addy	
109	Glen Reagan	Mormon Lake Fire Department
110	Valerie Crowley	
157	Trenton Mabey	
255	Leda Gray	
334	Linda Matthews	
589	John Miranda	
641	Gail Heyer	
663	Ann Brady	
769	Stephanie Hammond	
776	Michael Morningstar	
889	Kathryn Buttles	
1101	Jill Kyriakopoulos	
1278	M.E. Raines	
1574	Luisa Rodriguez Connal	
1601	Douglas Schwamb	

Commenter Code	Commenter	Organization
1638	Mary Swersey	
1755	Nenah Sylver	
1787	Robert Steele	
1788	Reana Haman	

Appendix E. Other 1982 Planning Rule Provisions

Introduction

This appendix fulfills the remaining 1982 planning rule provisions and other planning related requirements that are not satisfied in the main body of the FEIS: benchmark analysis and financial evaluation.

Benchmarks Analysis Report for the Revision of the Coconino National Forest Plan

Information prepared by Jim Beard, Carol Boyd, Heather Green, Kim Newbauer, Christine Paulu, and Rory Steinke of the Coconino NF (March 2010). The information was updated by Sara Dechter, Kim Newbauer, and Shawn Martin of the Coconino NF (October 2011) and Vernon Keller, Gary Hase, Randy Fuller, Henry Provencio, Charlotte Minor (September and October 2016) of the Coconino National Forest.

Introduction

Benchmark data from the 1987 Coconino NF plan (the 1987 plan) and 1987 final environmental impact statement (EIS) for the Coconino NF plan was reviewed during plan revision to determine if there was a need to change any previously established benchmarks.[1] Benchmarks set the threshold for alternative development decision space, particularly the upper end. In the 1987 plan EIS, alternatives were output-driven and influenced by the ability of the forest to provide goods and services. Results of this review should not be interpreted to suggest that the forest will revert to outdated language such as board feet instead of cubic feet nor is the forest intending to pursue a maximum output-related alternative such as maximum timber. The forest is intending to revise the plan with a focus on outcomes. Consequently, in the proposed revised plan, desired conditions will be emphasized instead of desired amounts of goods or services.

This review is being done because the forest has elected to use the provisions of the 1982 planning rule to complete its plan revision. Benchmark analysis is a required part of those provisions pertaining to the "Analysis of the Management Situation." If, in the process of alternative development, it is discovered that an alternative falls outside the range of an existing benchmark, then the affected benchmark will need to be reevaluated and reestablished as necessary.

Summary for Setting Plan Benchmarks

In the 1987 plan EIS, the forest established 11 economic benchmarks to set a minimum and maximum range for outputs for the development of alternatives:

- Sawtimber – thousand board feet (MBF) and hundred cubic feet (CCF)
- Net merchantable timber – hundred cubic feet (CCF)
- Timber products – thousand board feet (MBF) and hundred cubic feet (CCF)
- Firewood – thousand cords (Mcords) and hundred cubic feet (CCF)
- Grazing capacity – thousand animal unit months (MAUM)

[1] See pages 341-371 in the 1987 plan DEIS (USDA Forest Service 1987b).

- Permitted Livestock Use – thousand animal unit months (MAUM)
- Wilderness Recreation – thousand recreation visitor days (MRVD)
- Developed Recreation – thousand recreation visitor days (MRVD)
- Dispersed Recreation – thousand recreation visitor days (MRVD)
- Wildlife Recreation – thousand wildlife and fish user days (MWFUD)
- Water Yield – thousand acre feet (MacFt)

Of the 11 benchmarks, 8 are deemed adequate to set the range of the alternatives that may be developed as part of Coconino NF plan revision and 3 require modification, because they exceed or fall below previously established benchmarks or are accounted for within another benchmark (see Table E- 1). Methods used to review the benchmarks are described following Table E- 1.

Wilderness recreation MRVDs exceed the previously established maximum benchmark according to National Visitor Use Monitoring (NVUM) from 2005 (USDA Forest Service 2016a), and 2010 (USDA Forest Service 2016b). Although Coconino NF 2015 NVUM data was not available at the time of these revisions, national data that estimate visits to national forests is available for 2015 (USDA Forest Service 2016c) and the average growth rate was used to project recreation use trends. The previous benchmark was based on the projected use and past history of uses.

Developed recreation MRVDs fall below the previously established minimum benchmark from 2000 to 2010, and continue to be less than the established benchmarks through 2020. The previous benchmark was based on past history of uses and the assumption that demand would increase proportional to Arizona's population increase. Current NVUM data was used for both developed and dispersed recreation MRVDs. Wildlife and fish user day benchmark was grouped with dispersed recreation. NVUM data estimates the volume of recreation use on each national forest through on site surveys at day-use and overnight developed sites, general forest areas including dispersed camping and trailheads, and wildernesses. It is completed in 5-year cycles and baseline data for long-term trends started in 2005. The NVUM data do not differentiate between wildlife-based and other types of recreation. For plan revision, dispersed recreation was considered to include wildlife-related activities.

Table E- 1 compares previously developed benchmarks to estimates of future expected outputs under current management. All previously established benchmarks are assumed to be valid except for modified benchmarks, which appear in bold font.

Table E- 1. Comparison of past benchmarks to estimates of future expected outputs

Benchmark	Range	Benchmark Projections[1] of Average Annual Output by Time Period		Estimated Average Outputs Using Current Data	
		Period 3 2001-2010	**Period 4 2011-2020**	**Period 3**	**Period 4**
Sawtimber	Minimum	0	0		
MBF/CCF	Maximum	147,943/ 227,832	157,704/ 242,864	5,181/ 7,979	49,524/ 76,267
Net Merchantable Timber	Minimum	0	0		
CCF	Maximum	298,010	343,870	16,390	247,610
Timber Products	Minimum	0	0		
MBF/CCF	Maximum	42,848/ 58,359	75,012/ 102,166	2,833/ 3,858	14,851/ 20,227
Firewood	Minimum	0	0		
cords/CCF	Maximum	111,740/ 87,939	78,088/ 61,455	14,866/ 11,700	27,954/ 22,000
Grazing Capacity	Minimum	0	0		
MAUM	Maximum	378	391	Assumed within previous benchmark[2]	Assumed within previous benchmark
Permitted Livestock Use	Minimum	0	0		
MAUM	Maximum	358	378	153	Assumed within previous benchmark
Wilderness Recreation	Minimum	0	0		
MRVD	Maximum	60	88	91[3]	**123**
Developed Recreation	Minimum	1,010	1,035		
MRVD	Maximum	2,460	1,708	**857**[4] (<previous min. benchmark)	**941** [5]
Dispersed Recreation	Minimum	230	275		
MRVD	Maximum	2,128	2,422	1,717[4]	1,907[5]
Wildlife Recreation	Minimum	162	142		
MWFUD	Maximum	308	317	Included in dispersed recreation	
Water Yield	Minimum	0	0		
MacFt	Maximum	361	369	352	360

[1] The benchmark units and time periods shown were established in the 1987 plan EIS and were kept for this analysis.

[2] See explanation in range section below.

[3] Updated to use NVUM data and growth rates instead of 3.1% population growth rate

[4] Updated to use NVUM data and growth rates instead of 3.1% population growth rate

[5] Updated to use NVUM data and 10 year projected average growth rate by site type.

Methods

Timber/Forest Products

Based on current knowledge, possible alternatives for plan revision are expected to fall within previously established benchmarks set for sawtimber, net merchantable timber (sawtimber plus pulpwood), timber products (pulpwood), and firewood in the 1987 plan EIS. Current harvested volumes of these resources are lower than the predicted maximum benchmark and above the minimum value of zero. Even considering alternatives that could include greater harvest levels, the forest timber sale contracting officer estimated that harvest volumes for sawtimber, net merchantable timber, products, and firewood would be well within the benchmarks established for the 1987 plan.

Cut and sold reports from 1987 to 2009 were reviewed in addition to projections for the timber-related products by Kim Newbauer, Coconino NF timber sale contracting officer. Comparisons between the 1987 plan EIS and current values are in Table E- 2 and Table E- 3. A summary of cut and sold reports is provided in appendix A of the "Draft Benchmark Analysis Report for Revision of the Coconino National Forest Plan" (USDA Forest Service 2010a). To compare benchmarks in alternatives B (modified), C, and D, which use CCF as their unit of measure, and alternative A (1987 plan), which uses MBF, MCF and cords, both sets of measurements are displayed in the table using the conversion factors show in the footnotes.

Table E- 2. Comparison of past benchmarks to actual cut volume

Benchmark	Range	1987 Plan EIS Benchmark Projections		Actual Cut Volume
		Period 3 2001-2010	Period 4 2011-2020	Average 2001-2009
Net Sawtimber Volume	Minimum	0	0	5,181/7,979
Average Annual MBF/CCF1	Maximum	147,943/227,832	157,704/242,864	
Net Merchantable Timber	Minimum	0	0	16,390
Volume Average Annual CCF[1] (sawtimber plus pulpwood)	Maximum	298,010	343,870	
Products Volume Average Annual MBF and CCF[1](pulpwood)	Minimum	0	0	2,833/3,858

[1] Using a conversion factor for the Southwestern Region of pulpwood [5 - 8.9" d.b.h.] = 0.638mbf/1ccf, and sawtimber [9"+ d.b.h.] = 0.46mbf/1ccf. To use these conversion, multiply MBF by (1+1/x): where x is the conversion number.

Table E- 3. Comparison of 1987 plan EIS benchmarks and actual cut volumes of firewood

Benchmark	Range	1987 Plan Benchmark Projections		Actual Cut Volume
		Period 3 2001-2010	Period 4 2011-2020	Average 2001-2009
Firewood	Minimum	0	0	14,866/11,700
(Average Annual Cords[1]/CCF[2])	Maximum	111,740/87,939	78,088/61,455	

[1] 1987 Plan EIS lists the units for firewood as MCords, however, based on our review of the 1987 cut and sold report, these values should have been cords, rather than thousands of cords.

[2] Conversion factors of 0.787 CCF per cord was used.

Current trends for sawtimber and pulpwood are expected to continue. However, three scenarios may affect future sawtimber, net merchantable timber, and timber product volumes over the next 10 years: (1) possible market upturn, (2) increase in biomass fuel production, and (3) the Four Forest Restoration Initiative.[2]

Market Upturn: If the economy improves and housing construction increases, the Coconino NF's timber program is anticipated to be similar to the levels existing from 2001 through 2008 (average annual volume of 5,181 MBF sawtimber and pulpwood). Based on recent sales, sawtimber is typically two-thirds of the volume and pulpwood is typically one-third of the volume. This translates to:

- 3,457 MBF sawtimber (5,185 MBF x 0.66)
- 1,728 MBF pulpwood or timber products (5,185 MBF x 0.33)
- 1,032 MCF net merchantable timber (5,185 MBF x 2 = 10,316 CCF/10)

Increase in Biomass Demand: If biomass becomes more economical as an alternative fuel, it is anticipated that demand for biomass material will increase substantially. For example, there is currently a proposal to use biomass to fuel a new cement plant at Drake, north of Prescott. A biofuel economy that uses forest products, has the potential to increase the Coconino NF's program by approximately 30,000 to 50,000 CCF per year (15,000 to 25,000 MBF) of sawtimber and pulpwood. This translates to:

- 16,667 MBF sawtimber (25,000 MBF x 0.66)
- 8,333 MBF pulpwood or timber products (25,000 MBF x 0.33)
- 5,000 MCF net merchantable timber (25,000 MBF x 2 = 50,000 CCF/10)

Four Forest Restoration Initiative: General assumptions with potential volume from the Four Forest Restoration Initiative (4FRI) were used; these can be adjusted in the future if needed. It is assumed there would be no timber-related volume from 4FRI until 2014, when the project's NEPA documents would be completed and a contract would be awarded. It was assumed that once treatments commenced, an average of 30,000 acres per year would be treated between 2014 and 2020 (period 4 in Table E- 3, 70 percent of the acres, or 21,000 acres per year, would be treated on the Coconino NF, and the remaining treatment acres would be on the other national forests. Treatments would result in an average of up to 8.4 CCF per acre (based on the forest's current production averages) or 176,400 CCF (88,200 MBF) per year when treatments occur. The average annual volume for years 2011 to 2020 would be 61,740 MBF because no treatments would occur during the first four years due to NEPA document preparation. This translates to:

- 40,748 MBF sawtimber (61,740 MBF x 0.66)
- 20,374 MBF pulpwood or timber products (61,740 MBF x 0.33)
- 12,348 MCF net merchantable timber (61,740 MBF x 2 = 123,480 CCF/10)

[2] The Four Forest Restoration Initiative is a collaborative-based effort to increase spatial scales and decrease timeframes required to implement forest restoration efforts. It is planned to be conducted exclusively in ponderosa pine ecosystems across northern Arizona, including the Kaibab, Coconino, Apache-Sitgreaves, and Tonto National Forests. The goal is to implement ecologically designed treatments placed strategically across the landscape to reduce the threat of landscape-scaled high-severity wildland fire, reintroduce fires with planned ignitions, and support local wood products-based industries in surrounding communities.

Summary of Above Scenarios: If these possible scenarios are realized, the combined production totals are estimated as follows:

- 60,872 MBF sawtimber (3,457 + 16,667 + 40,748 MBF)
- 30,435 MBF pulpwood or timber products (1,728 + 8,333 + 20,374 MBF)
- 18,379 MCF net merchantable timber (1,031 + 5,000 + 12,348 MCF)

These totals are within the benchmarks established in the 1987 plan (see Table E- 2).

Firewood

With recent fossil fuel price increases there has been a surge in firewood demand. We assumed demand for firewood would continue to rise because of increasing emphasis on alternative energy and stable to increasing costs for home heating. We assumed the increase would be 300 MBF per year based on the difference between volume of firewood cut between 2001 and 2009 (4,731 to 8,007 MBF). Continuing on the current trend, we would expect 2020 firewood demand to be approximately 11,000 MBF (27,954 Cords). This is well within the projected minimum and maximum values from the 1987 EIS (see Table E- 3).

Range

Since the 1987 plan, the Coconino NF has reduced the number and size of its allotments. In addition, stocking has been reduced in some areas. The result is a reduction of permitted use. Permitted use is expected to be lower than the previously established maximum benchmarks in periods 3 and 4 because of these reductions (Table E- 4). When the 1987 plan was being created, permitted livestock use was closely aligned with capacity that was calculated using factors such as canopy cover and soil productivity. The Coconino NF no longer calculates capacity in the same way; instead permitted and authorized livestock use is derived using an adaptive management approach based on monitoring.

Table E- 4. Comparison of 1987 plan EIS range benchmarks and current data

Benchmark	Range	1987 Plan EIS Benchmark Projections		Current Use
		Period 3 2001-2010	Period 4 2011-2020	
Average annual MAUMs[1]	Minimum	0	0	Assumed within previously established benchmarks[2]
Grazing Capacity	Maximum	378	391	
Average annual MAUMs	Minimum	0	0	
Permitted Use	Maximum	358	378	2015 grazing year permitted use was 111.3

[1] Thousand animal unit months

[2] Per the previous explanation

Recreation

National forest visits by site type were calculated using National Visitor Use Monitoring data converted into thousand recreation visitor days[3]; 2005 (USDA Forest Service 2016a) and 2010 (USDA Forest Service 2016b) NVUM data were used as a reasonable approximation of the average annual recreation use during the 2001 to 2010 time period. NVUM is the best available data and the nationally recognized strategy for estimating recreation use. This is compared to 1987 Plan EIS benchmarks in Table E- 5. As a surrogate for estimated future increases, it was originally assumed that demand for recreation is closely tied to population levels. Arizona experienced higher than national population growth for several years. The average annual population growth rate was originally estimated at 3.1 percent (USDA Forest Service 2010b). It was estimated there would be a corresponding 3.1 percent annual increase in recreation demand for all three benchmarks (Table E-5). Recent population projects have significantly reduced this estimate closer to 1.05 to 1.08 percent. When these rates are compared with 2015 national NVUM recreation use data, they are still higher than NVUM percent change estimated for 2010 to 2015. Clearly population growth is a potential variable affecting recreation use, but actual changes in use vary according to changes in other social or economic variables. The economic recession that started in 2009 correlates with reduced recreation use, and subsequent slow economic growth rates seem to relate to flat or small increases in developed and dispersed recreation use. Only wilderness recreation use has steadily increased. Clearly, not all variables that predict recreation use or demand have been identified.

The results of this approach indicate that wilderness MRVD values exceed maximum benchmark values in the 1987 plan EIS and the calculated figures establish new maximum wilderness recreation benchmarks for periods 3 and 4. For developed recreation, the current estimates do not reach minimum benchmark values in period 3 and projected period 4 values of the 1987 plan EIS. New lower benchmark values for developed recreation replace the 1987 plan benchmarks. The projected dispersed recreation values fall within previously developed benchmark projections.

Calculations

Updated Assumption: The original assumption of 3.1 percent population growth has been revised down in both the U.S. Census predictions and by the State of Arizona Office of Employment and Population Statistics. Current figures predict a 1.05 to 1.08 percent population growth rate. While these may correlate somewhat with wilderness use rates, they do not appear to be accurate for developed recreation and dispersed recreation. Calculations made using the 2005 and 2010 NVUM numbers are appropriate for period 2001 through 2010. In order to better estimate use through 2020, the 2015 national NVUM use rate was compared with the assumption of a 3.1 percent population growth rate in Table E- 7.

[3] MRVD is not used as the standard for measuring recreation use any longer, but for the purposes of comparing similar outputs, the estimated visitor use numbers were converted to MRVD.

Table E- 5. Comparison of 1987 plan EIS recreation benchmarks and current data

Benchmark	Range	1987 Plan EIS Benchmark Projections of Average Annual Output	Earlier Estimated Average Outputs Based on Population Growth	Current Estimated Average Outputs Based on NVUM Percent Change

		Period 3 2001-2010	Period 4 2011-2020	Period 3[1] 2001-2010	Period 4[2] 2011-2020	Period 3[3] 2001-2010	Period 4[4] 2011-2020
Wilderness	Minimum	0	0				
Recreation (MRVD)	Maximum	60	88	89 (Alternatives B (modified) and D) 92 (Alternative C)	123	89 (Alternatives B (modified) and D) 94[5] (Alternative C)	132[6]
Developed	Minimum	1,010	1,035				
Recreation (MRVD)	Maximum	2,460	1,708	857	1,185	857	941
Dispersed	Minimum	230	275				
Recreation (MRVD)	Maximum	2,128	2,422	1,717	2,375	1,717	1,907

[1] Period 3 (2001-2010) represents the NVUM starting amount and the average of 2005-2010 estimates based on 3.1 percent population growth.

[2] Period 4 (2011-2020) represents the average of 2011-2020 estimates based on 3.1 percent population growth rates.

[3] Period 3 (2001-2010) represents NVUM percent change amounts by site type.

[4] Period 4 (2011-2020) represents the average of the NVUM percent change amounts by site type.

[5] Updated period 3 for wilderness increases NRVDs to reflect the increased wilderness acres in alternative C.

[6] Updated period 4 continues to increase MRVDs to reflect the increased wilderness acres in alternative C.

Table E- 6 shows the recreation visitor day (RVD) values for 2005 and 2010 from the NVUM data. It also shows the 2005 values converted into MRVDs so they can be compared to the 1987 plan EIS. It was assumed that the 2005and 2010 values reasonably represent the average annual output for the 10 years represented by period 3 (2001 to 2010). To get starting values for 2011 in period 4, originally a 3.1 percent annual increase was assumed between 2010 and 2015. Using this, the average RVDs for period 4 (2011 to 2020) was calculated assuming the 3.1 percent annual increase for each year; this is shown in Table E- 7. However, when this is compared to the 2010 Coconino NF use figures for 2010, there appears to be a decrease in use across all site types (see Table E- 8). The 2006-2015 national NVUM findings (combined data for all national forests) show a much lower rate of increase for all site types. It does not appear to be a reasonable assumption that recreation use is solely based on population growth. Other factors such as economic health and stability influence participation in recreation activities.

Table E- 6. Comparison of 2005 and 2010 recreation visitor days for Coconino NF

Site type	2005 RVDs (MRVD)	2010 RVDs (MRVDs)
Developed site	1,,000,100 (1,000.1)	882,130 (882.13)
General Forest Area (undeveloped or dispersed areas)	1,395,000 (1,395)	1,151,250 (1,151.25)
Wilderness	2,481,500 (2,481.5)	2,158,630 (2,158.63)

Table E- 7. Comparisons of estimated increase in recreation RVDs for periods 3 and 4

Year	Wilderness Recreation MRVDs (3.1% annual increase population)	Wilderness Recreation MRVDs (NVUM% annual change per Table E-8 unless noted)	Developed Recreation MRVDs (3.1% annual increase population)	Developed Recreation MRVDs (NVUM% annual change per Table E-8 unless noted)	Dispersed Recreation MRVDs (3.1% annual increase population)	Dispersed Recreation MRVDs (NVUM% annual change per Table E-8 unless noted)
2005	89	89	857	857	1,717	1,717
2006	92	89.9*	884	865.6**	1,770	1,734.2
2007	95	91.0	911	875.2	1,825	1,751.7
2008	98	91.9	939	883.7	1,882	1,769.6
2009	101	92.8	968	892.2	1,940	1,786.9
2010	104	93.8	998	900.8	2,000	1,804.8
2011	107	94.8	1,029	909.5	2,062	1,822.4
2012	110	95.8*	1,061	918.5**	2,126	1,840.7
2013	114	96.8*	1,094	927.7**	2,192	1,859.1
2014	117	97.8*	1,128	937.0**	2,260	1,877.7
2015	121	98.8*	1,163	946.4**	2,330	1,896.4
2016	125	99.8*	1,199	955.8**	2,402	1,915.4
2017	128	100.9*	1,236	965.4**	2,477	1,934.6
2018	132	102.0*	1,275	975.1**	2,553	1,953.9
2019	136	103.0*	1,314	984.8**	2,633	1,973.5
2020	141	104.1*	1,355	994.7**	2,714	1,993.2

*Use 5-year average percent change 1.05% for wilderness

** Use 5-year average percent change of 1% for developed and dispersed recreation

Table E- 8. National Visitor Use Monitoring national data (USDA Forest Service 2016b) with percent changes by time period and site type

Time Period	Site Type		
	Developed Recreation	General Forest Areas	Wilderness MRVDs
FY 2006-2010 MRVDs	76,605.2	78,430.0	6,227.8
Percent Change	1.11%	1.01%	1.13%
FY 2007-2011 MRVDs	84,873.3	79,388.3	7,059.3
Percent Change	0.97%	1.02%	1.04%
FY 2008-2012 MRVDs	82,198.7	80,975.8	7,368.2
Percent Change	0.96%	0.98%	1.01%
FY 2009-2013 MRVDs	78,877.5	79,139.2	7,423.2
Percent Change	0.97	1.00	1.03%
FY 2010-2014 MRVDs	76,602.2	78,894.2	7,612.0
Percent Change	0.96%	0.98%	1.05%
FY 2011-2015 MRVDs	73,487.2	77,444.2	7,992.4

Using the national figures, the percent change for developed recreation has fluctuated during each time period, and appears to be declining slightly nationally. Use at general forest areas has also fluctuated, but appears to be fairly flat. Wilderness is the only site type that has consistently grown in use. Where applicable, the actual percent changes were used in the calculations in Table E- 7. Where data are not available, the average of these percent changes was used to project yearly changes.

The more detailed calculations below show how day use and overnight use at developed sites were used to derive developed site RVDs. They also show how general forest area, a proxy for dispersed recreation, and wilderness data were used.

Summary of site visit calculations for 2005 NVUM use data:

- 2005 Day Use Developed Sites (DUDS): 2,308,000 site visits, average duration of visit = 2.0 hours
- Overnight Use at Developed Sites (OUDS): 148,000 site visits, average duration of visit = 49.9 hours
- 2005 General Forest Areas (GFA): 2,700,000 site visits, average duration of visit = 6.2 hours (This calculation was considered to be equivalent to dispersed recreation, which included wildlife-related activities.)
- 2005 Wilderness: 384,000 site visits, average duration of visit = 2.7 hours

A recreation visitor day (RVD) equals one 12-hour day for 1 person visiting the Coconino NF. Thus, 1 person visiting the forest for 12 hours equals 1 RVD.

Summary of 2005 RVD calculations:

- DUDS = total DUD visit x average duration of visit/12 hours = (2, 308,000 visits x 2.0 hours)/12 hr = 384,667 RVDs

- OUDS = total OUDS visits x average duration of visit/12 = (148,000 visits x 49.9 hours)/12 hours = 615,433 RVDs
- Total Developed Site RVDs (totals of DUDS + OUDS) = 1,000,100 RVDs
- GFAs (undeveloped areas) = total undeveloped area visits x average duration of visits/12 = (2,700,000 visits x 6.2 hr)/12 = 1,395,000 RVDs
- Wilderness: total wilderness visits x average duration of visit/12 = (384,000 visits x 2.7 hr)/12 = **86,400 RVDs.** (For establishing the wilderness benchmark, an additional 30,000 visits (7,500 RVDs) were estimated based on the increased amount of wilderness under alternative C, equaling 93,900 RVDs.)

Summary of 2005 estimated benchmarks:

- Developed Site RVDs (DUDS + OUDS) = 1,000,100 RVDs or 1,000.1 MRVDs
- GFA RVDs = 1,395,000 RVDs or 1,395 MRVDs
- Wilderness = 86,400 RVDs or 86.4 MRVDs
- Total CNF RVDs = 2,481,500 or 2,481.5 MRVDs

Summary of site visit calculations for 2010 NVUM use data:

- 2010 Day Use Developed Sites (DUDS): 2,244,000 site visits, average duration of visit = 2.0 hours
- Overnight Use at Developed Sites (OUDS): 128,000 site visits, average duration of visit = 41.2 hours
- 2010 General Forest Areas (GFA): 1,842,000 site visits, average duration of visit = 6.2 hours (This calculation was considered to be equivalent to dispersed recreation, which included wildlife related activities.)
- 2010 Wilderness: 501,000 site visits, average duration of visit = 2.7 hours

A recreation visitor day (RVD) equals one 12-hour day for 1 person visiting the Coconino NF. Thus, 1 person visiting the forest for 12 hours equals 1 RVD.

Summary of 2010 RVD calculations:

- DUDS = total DUD visit x average duration of visit/12 hours = (2,244,000 visits x 2.0 hours)/12 hr = 374,000 RVDs
- OUDS = total OUDS visits x average duration of visit/12 = (148,000 visits x 41.2 hours)/12 hours = 508,133 RVDs
- Total Developed Site RVDs (totals of DUDS + OUDS) = 882,133 RVDs
- GFAs (undeveloped areas) = total undeveloped area visits x average duration of visits/12 = (1,842,000 visits x 7.5 hr)/12 = 1,151,250 RVDs
- Wilderness: total wilderness visits x average duration of visit/12 = (501,000 visits x 3.0 hr)/12 = **125,250 RVDs**. (For establishing the wilderness benchmark, an additional 30,000 visits (7,500 RVDs) were estimated based on the increased amount of wilderness under alternative C, equaling 132,750 RVDs.)

Summary of 2010 estimated benchmarks:

- Developed Site RVDs (DUDS + OUDS) = 882,133 RVDs or 882.13 MRVDs
- GFA RVDs = 1,151,250 RVDs or 1,151.25 MRVDs
- Wilderness = 125,250 RVDs or 125.25 MRVDs

Total CNF RVDs = 2,158,630 or 2,158.63 MRVDs

Water Yield

Previously developed benchmarks were compared to estimated current and future water yields to evaluate whether benchmarks used in the 1987 plan were exceeded (Table E- 9). Both current and future estimated water yields fall within the previously established benchmarks.

Table E- 9. Comparison of 1987 plan benchmarks and current data for water yield

Benchmark	Range	1987 Plan EIS Benchmark Projections		Current Projections (2010)	Future Projections
		Period 3 2001-2010	Period 4 2011-2020		
Water Yield (MacFt)	Minimum	325	325	Assumed similar	Assumed similar
	Maximum	361	369	352	360

Calculations were made using the same water yield formula used in the 1987 plan and compared against current water yield and anticipated yield from future vegetative treatments. Forest water yield in the 1987 plan EIS was calculated by determining the water yield for individual vegetation types; multiplying the water yield by the number of acres of each vegetation type, and summing the resulting value.[1]

Only ponderosa pine water yield was evaluated for potential change because the majority of past treatments occurred in ponderosa pine, and it was assumed the majority of future vegetative treatments would also occur in this type. Because no major treatment objectives are proposed outside of ponderosa pine, the water yields from the other vegetation types were adopted from the 1987 plan. These yields were added to the adjusted ponderosa pine water yield values (Table E- 10). It was assumed future ponderosa pine vegetative treatments would occur at a rate of about 30,000 acres per year, reduce basal area to 95 square feet per acre, and potentially change water yield. Recent stream flow data from gauged sites indicates flow has been static or had a very slight decline over the last 10 years (USDA Forest Service 2007). According to current forest plan specialist reports and research, water yield does not tend to decrease much above 120 basal area in ponderosa pine.

Summary of water yield in ponderosa pine:

- Current water yield AcFt = background value of 1987 plan – (1987 plan coefficient x average forest residual basal area) x acres ponderosa pine on forest

Assuming the estimated current (2010) basal area of ponderosa pine is 110, then…

[1] Many assumptions and methods of determining water yield are based on the Guide for Determining Water Yield Improvement Opportunities (USDA Forest Service 1982). Water yield background values and associated coefficients for commercial forests were agreed upon by a soil and watershed workgroup in 1984 and were derived from research. Research includes from J.P. Potundy (USDA Forest Service 1982) and P. Jackson (USDA Forest Service 1984).

- Current water yield = 0.3958 – (0.001038 x 110 sq. ft/acre) = 0.282 AcFt/Yr x 534,540 ponderosa pine acres = **150,500 AcFt/Yr**

Assuming future average basal area of ponderosa pine is 95, then…

- Future water yield = 0.3958 – (0.001038 x 95sq. ft/acre) = 0.297 AcFt/Yr x 534,540 ponderosa pine acres = **158,800 AcFt/Yr**

At estimated treatments of 30,000 acres per year, ponderosa pine basal area would probably be reduced to 60 and average about 95 square feet per acre forestwide. Forestwide water yield would increase to about 360 thousand acre feet per year in the short term for about up to 10 years and then decrease to current yield unless understory maintenance would occur that could keep water yield at this level. Table E- 10 compares the 1987 plan with estimated current and future water yield values.

Table E- 10. Water yield by vegetation type and acres on the forest

Vegetation Type	Forest Acres	Coefficient	Water Yield (AcFt/Yr)		
			1987 Plan	Current	Future
Alpine	1,382	0.910	1,258		
Spruce Fir	18,927	0.698	13,211		
Mixed Conifer	73,069	0.550	40,188		
Ponderosa Pine	534,540	0.297	145,000	150,500	158,800
Grassland	214,029	0.178	37,669		
Pinyon Juniper	736,850	0.075	55,264		
Riparian	25,136	1.038	26,091		
Open Water	8049	2.077	16,718		
Desert	218,755	0.040	8,750		
Chaparral	19,481	0.095	1,870		
Total			346,019	351,019	359,819

Summary for Evaluation of Alternatives using Plan Benchmarks

Timber/Forest Products

Estimated production for alternatives ranges from 41,251 CCF (alternative A) to 167,222 CCF (alternatives B (modified), C and D) for sawtimber, and 5,804 CCF (alternative A) to 25,848 CCF (alternatives B (modified), C and D) for timber products (e.g., pulp, poles, and posts). All of these alternatives, therefore, fall within the previously estimated benchmarks in the 1987 plan for timber and forest products.

Firewood

All alternatives were estimated to produce 13,687 CCF of firewood, which falls within the previously established benchmarks of the 1987 plan.

Range

There is no anticipated increase in animal unit months (AUMs) based on alternatives developed in the FEIS and, therefore, all alternatives fall within the previously established benchmarks of the 1987 plan.

Recreation

Except for the wilderness recreation benchmark, recreation benchmarks are not expected to see an increase or decrease in visitation based on the alternatives developed. All of the alternatives fall within the previously established benchmarks of the 1987 plan for developed and dispersed recreation.

The increase in wilderness recreation is expected to exceed the maximum previously established benchmark values in the 1987 plan EIS. New maximum wilderness recreation benchmarks for period 3 and period 4 were established for all alternatives. For alternative C, the wilderness benchmark was adjusted up 30,000 visits based on the estimated increase in wilderness visitation in the "Social and Economic Report" for alternative C. Alternative C adds so much additional wilderness that it is assumed there will be a bump in visitation, especially because so much of it is within 90 minutes of the Phoenix metropolitan area.

Water Yield

It is estimated that overall forest water yield is static to slightly downward over the last 20 years due to analysis of streamflow water yield and the following two conditions:

- Greater tree and shrub basal area and canopy cover has been observed in several ERUs and recorded over the last 20 years based on aerial photo analysis and the Anderson Mesa Landscape Scale Assessment Vegetation Group Specialist Report (USDA Forest Service 2004) which probably results in increased evapotranspiration and decreased runoff and water yield.
- Drought conditions have prevailed in most years since about 1999, and have probably contributed to decreased precipitation and runoff and water yield. Climatic conditions (e.g., drought) and vegetative conditions on the Little Colorado River watersheds are similar to the Verde River watersheds and, therefore, water yield trend is estimated to be similar (i.e., static to slightly downward).

Implementing vegetation treatment objectives under alternatives B (modified), C, and D could cause short-term increase in water yield to connected stream courses, springs, and groundwater, but they would be expected to last less than 10 years according to research (USDA Forest Service 1999).

The benchmark for period 4 reflects this expected trend for alternatives B (modified), C, and D. Additionally, alternative A falls within the benchmark because current trends are expected to continue to be static to declining. All four alternatives fall within the water yield benchmarks that were previously established in the 1987 plan.

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Appendix F. Forest Plan Language for Alternatives

This appendix provides specific plan language for alternatives C and D, should either of those alternatives be chosen as the selected action in the record of decision. As described in detail below, under alternatives C or D, some of the existing language from alternative B (modified) would be supplemented through additions, modifications, or replacements. Accordingly, unless there is an addition, modification, replacement, or other notification noted in this section, alternatives C and D are the same as alternative B (modified).

Alternative C

Alternative C responds to public comments for more lands to be managed in primitive and natural settings with reduced human-related disturbance. This alternative includes:

- retention of old growth direction from the 1987 plan,
- modification of the Anderson Mesa Management Area,
- 7 additional management areas,
- 13 recommended wilderness areas,
- addition of a guideline regarding livestock grazing in research natural area,
- modifications to the Recreation and Transportation Suitability Table, and
- addition of a suitability table for recreational shooting (i.e., non-hunting shooting) and snowmobile use.

Alternative C does not include the Inner Basin MA, C.C. Cragin Watersheds MA, and the Lake Mary Watersheds MA found in alternatives B (modified) and D.

If alternative C is selected, the following plan changes would be made. The format of some of the following plan components may need to be restructured to be consistent with the rest of the proposed plan, but the content and intent would be retained.

Old Growth

This section identifies the changes that would occur if alternative C is selected and the old growth retention direction from the 1987 plan is incorporated into the proposed plan. Incorporating the old growth retention direction from the 1987 plan would be accomplished by adding some new components and modifying some existing components in the proposed plan. Some of the language from the 1987 plan uses language and terminology that is unclear when removed from the context of the 1987 plan or inconsistent with the remainder of the proposed plan. To resolve these problems, some of the plan language from the 1987 plan has been edited to align them with the proposed plan, while preserving the content and intent of those plan components. In other instances, components in the proposed plan would need to be modified to include new language related to old growth retention. The plan components listed below are labeled as additions (signifying that this is a new component being carried over from the 1987 plan), replacements, or modifications (signifying that this is a component from the proposed plan that has been edited to include direction from the 1987 plan). The edits to the added and modified plan components have been written in italics.

Forestwide Management

Forest and Woodland ERUs

Forest and Woodland ERUs will be added as a new subsection as part of alternative C:

Standards for Forest and Woodland ERUs

The following Standards will be added as part of alternative C:

FW-TerrERU-FrstWdlnd-S

1 *Old growth* allocations will consist of landscape percentages meeting old growth conditions and not specific acres.

Guidelines for Forest and Woodland ERUs

The following Guidelines will be added as part of alternative C:

FW-TerrERU-FrstWdlnd-G

1 All analyses should be at multiple scales—one scale above and one scale below the ecosystem management areas. The amount of old growth *that* can be provided and maintained should be evaluated at the *6th code watershed* level and be based on *ERU*, site capability, and disturbance regimes.

2 Old growth compositional, structural, and functional *flow should be created or sustained as much* as possible over time at multiple-area scales. Old growth *function should be developed or retained* on at least 20 percent of the naturally forested area by *forest and woodland ERU* in any landscape *by 6th code watershed*.

3 The effects of spatial arrangement on old growth function *should be considered* from groups to landscapes, including de facto allocations to old growth such as goshawk nest sites, Mexican spotted owl protected activity centers, sites protected for species behavior associated with old growth, wilderness, research natural areas, and other forest structures managed for old growth function.

4 In allocating old growth and making decisions about old growth management, *current information should be* used to evaluate the relative risks to sustaining old growth function at the *multiple-area* scales, due to natural and human-caused events.

5 *Forest and woodland* sites should meet or exceed the structural attributes to be considered old growth in *the Pinyon Juniper Evergreen Shrub, Pinyon Juniper with Grass, Pinyon Juniper Woodland, Ponderosa Pine, Mixed Conifer with Frequent Fire, Mixed Conifer with Infrequent Fire, and Spruce Fir ERUs* in the Southwest as depicted in the Table A [Table F- 1]. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth.*

6 Greater density of snags *should be retained* adjacent to meadows, riparian areas, and key water sources to enhance habitat for snag-dependent species.

Table A [Table F- 1]. Minimum criteria for the structural attributes used to determine old growth

ERU	PJ Types		PP		Aspen	MC Types		SF	
Site Capability	**Low**	**High**	**Low**	**High**	**All**	**Low**	**High**	**Low**	**High**
Live Trees in Main Canopy:									
Trees/Acres	12	30	20	20	20	12	16	20	30
Size d.b.h./DRC	9”	12”	14”	18”	14”	18”	20”	10”	14”
Age (Years)	150	200	180	180	100	150	150	140*/170**	140*/170**
Dead Trees									
Standing									
Trees/Acre	0.5*	1	1	1	ND	2.5	2.5	3	4
Size d.b.h./DRC	9”	10”	14”	14”	10”	14”	16”	12”	16”
Height (feet)	8’	10’	15’	25’	ND	20’	25’	20’	30’
Down									
Pieces/Acre	2	2**	2	2	ND	4	4	5	5
Size (Diameter)	9”	10”	12”	12”	ND	12”	12”	12”	12”
Length (Feet)	8’	10’	15’	15’	ND	16’	16’	16’	16’
Number of tree canopies* **	SS/MS	SS/MS	SS/MS	SS/MS	SS	SS/MS	SS/MS	SS/MS	SS/MS
Total BA, Square Feet/Acre	6	24	70	90	ND	80	100	120	140
Total Canopy Cover, Percent	20	35	40	50	50	50	60	60	70

*For Pinyon Pine in *Pinyon Juniper ERUs*: Dead limbs help make up dead material deficit. *For Spruce-Fir ERU*: In mixed corkbark fir and Englemann spruce stands where Englemann spruce is less than 50 percent composition in the stand.

**For Pinyon Pine in *Pinyon Juniper ERUs*: Unless removed for firewood or fire burning activities. *For Spruce-Fir ERU*: In mixed corkbark fir and Englemann spruce stands where Englemann spruce is less than 50 percent composition in the stand.

***ND is not determined; SS is single-storied; and MS is multistoried

Management Approaches for Forest and Woodland ERUs

The following Management Approaches will be added as part of alternative C:

Use information about pre-European settlement conditions *or reference conditions* when considering the importance of various factors.

Use quantitative models when considering the importance of various factors. These models may include, but are not limited to: Forest Vegetation Simulator, BEHAVE, and FARSITE.

Areas managed for old growth, bear, and Mexican spotted owls *should* be the same.

Pinyon Juniper ERU Direction in Proposed Plan

The following adjustments will be applied to Pinyon Juniper ERU direction as part of alternative C:

Desired Conditions for Pinyon Juniper ERU

The following Desired Conditions will be added as part of alternative C:

FW-TerrERU-PJ-DC

17 *In all Pinyon Juniper ERUs, stands managed for old growth are at least 100 to 300 acres in size and greater than or equal to 330 feet wide or are in closely grouped stands that provide contiguous habitat for interior dwelling species. Old growth components include old trees, dead trees (e.g., snags), downed wood (e.g., coarse woody debris), and structural diversity. Old growth structure and snags are generally provided on slopes greater than 15 percent; however, snags may be provided on slopes less than 15 percent if requirements (as shown in* Table A [Table F- 1]*, Minimum Criteria for the Structural Attributes Used to Determine Old Growth) for old growth characteristics (e.g., snags, downed logs, and old trees) cannot be met on the steeper slopes.*

18 In all *Pinyon Juniper ERUs*, most of the area greater than 15 percent slope is old growth and contains the snag component because it has not been cut and fire has been excluded. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris), and structural diversity.

The following Desired Condition will replace FW-TerrERU-PJ-DC-2, FW-TerrERU-PJ-DC-7, FW-TerrERU-PJ-DC-12 in the proposed plan as part of alternative C:

FW-TerrERU-PJ-DC

2 For areas outside of old growth stands in all Pinyon Juniper ERUs: Manage for at least an average of 1.0 snags per acre on 40 percent of the pinyon juniper woodland acres in each 6th code watershed. Snags are at least 9-inches diameter at root collar and at least 10 feet high.

For old growth stands: Stands managed for pinyon juniper old growth follow Table A [Table F-1] (Minimum Criteria for the Structural Attributes used to Determine Old Growth). For old growth stands: The minimum attributes for snags are: 0.5 snag/acre, 9 inches d.b.h./DRC, 8 feet tall (low sites) to 1 snag/acre, 10 inches d.b.h./DRC, 10 feet tall (high sites). They meet the needs of species that use snags and provide for future downed logs. In old growth stands, minimum attributes for downed logs are: 9-inch diameter at mid-point and 8 feet long for low sites; 10-inch diameter and 10 feet long for high sites; and there are at least 2 downed logs per acre.

Coarse woody debris, including large downed logs, is sufficient to maintain or improve long-term soil productivity and provide important wildlife habitat. Minimal total basal area ranges between 70 to 90 square feet per acre depending on site productivity and minimum total canopy cover ranges between 40 and 50 percent.

Standards for Pinyon Juniper ERU

The following Standard will be added as part of alternative C:

FW-TerrERU-PJ-S

1 Allocate no less than 20 percent of the *Pinyon Juniper ERUs* in *each 6th code watershed* to old growth as depicted in the Table A [Table F- 1]. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth.*

Guidelines for Pinyon Juniper ERU

The following Guideline will be added as part of alternative C:

FW-TerrERU-PJ-G

6 *At least 20 percent of the area within the 1,320-foot zone adjacent to pine stringers should be managed for dense mature or overmature stands of pinyon juniper.*

Aspen and Maple Direction in Proposed Plan

The following adjustments will be applied to Aspen and Maple direction as part of alternative C:

Desired Conditions for Aspen and Maple

The following Desired Condition will be modified as part of alternative C:

FW-TerrERU-AspMpl-DC

1 Where they naturally occur, all age classes of aspen and maple are present in groups or patches and are regenerating and vigorous, *reflecting natural disturbance patterns and processes and at levels similar to or greater than those at the time of Plan approval. These patches collectively contribute to a variable-aged landscape, and are regenerating and vigorous.* A diverse understory composed of native herbaceous and shrub species has a variety of seral and age classes and is vigorous and regenerating.

The following Desired Condition will be added as part of alternative C:

FW-TerrERU-AspMpl-DC

4 *Stands managed for aspen old growth follow* Table A [Table F- 1] *(Minimum Criteria for the Structural Attributes used to Determine Old Growth). In old growth stands, minimum attributes for snags are: 10 inches d.b.h. and density and height are not determined. Minimum attributes for downed logs are not determined. Coarse woody debris, including large downed logs, is sufficient to maintain or improve long-term soil productivity and provide important wildlife habitat. Minimal total basal area is not determined and minimum total canopy cover is 50 percent.*

Ponderosa Pine ERU Direction in Proposed Plan

The following adjustments will be applied to Ponderosa Pine ERU direction as part of alternative C:

Desired Conditions for Ponderosa Pine ERU

The following Desired Conditions will be modified as part of alternative C:

FW-TerrERU-PP-DC

5 *For areas outside of old growth stands:* The ponderosa pine forest vegetation community is composed predominantly of vigorous trees, but declining trees are a component and provide for snags, top-killed, lightning- and fire-scarred trees, and coarse woody debris (>3 inch diameter), all well-distributed throughout the landscape. Snags, down logs and coarse woody debris are representative of the species within the vegetation community. Ponderosa pine snags are typically 18 inches or greater at d.b.h. and average 1 to 2 snags per acre. There are varying sizes of snags greater than 18 inches d.b.h. In the Gambel oak subtype, large oak snags (>10 inches) are a well-distributed component. Downed logs (>12 inch diameter at mid-point, >8 feet long) average 3 logs per acre within the forested area of the landscape. Coarse woody debris, including downed logs, ranges from 3 to 10 tons per acre is sufficient to maintain or improve long-term soil productivity and provide cover and food for a variety of species.

Stands managed for ponderosa pine old growth follow Table A [Table F- 1] *(Minimum Criteria for the Structural Attributes used to Determine Old Growth). For old growth stands: Using* Table A [Table F- 1. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth, in old growth stands, minimum attributes for snags are: 14 inches d.b.h., 15 feet tall (low sites) to 25 feet tall (high sites) and there is at least 1 snag per acre. They meet the needs of species that use snags and provide for future downed logs. In old growth stands, minimum attributes for downed logs are: 12-inch diameter at mid-point and 15 feet long and there is at least 2 downed logs per acre. Coarse woody debris, including large downed logs, is sufficient to maintain or improve long-term soil productivity and provide important wildlife habitat. Minimal total basal area ranges between 70 to 90 square feet per acre depending on site productivity and minimum total canopy cover ranges between 40 and 50 percent.*

6 *In Ponderosa Pine ERU, stands managed for old growth are at least 100 to 300 acres in size. In addition,* old growth structure occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Consistent with vegetative characteristics of a frequent, low severity fire regime, old growth is a component of uneven-aged forests, generally composed of groups of similarly aged trees and single trees interspersed with open grass-forb-shrub interspaces, but occasionally, it occurs in larger even-aged patches where local microsites facilitate less frequent fire regimes. Within group variability may be low but variation among groups is typically high and proportions of patches with different developmental stages may vary depending on site-specific conditions. Old growth components include old trees, dead trees (snags), and dead and downed wood (coarse woody debris including large size classes). Snags and large dead and downed fuels are irregularly distributed across the landscape and may not exist in some patches. The location of old growth components shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

Standards for Ponderosa Pine ERU

The following Standard will be added as part of alternative C:

FW-TerrERU-PP-S

1 *Allocate no less than 20 percent of the Ponderosa Pine ERU in each 6th code watershed to old growth as depicted in* Table A [Table F- 1]. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth.*

Mixed Conifer with Frequent Fire ERU Direction in Proposed Plan

The following adjustments will be applied to Mixed Conifer with Frequent Fire ERU direction as part of alternative C:

Desired Conditions for Mixed Conifer with Frequent Fire ERU

The following Desired Conditions will be modified as part of alternative C:

FW-TerrERU-MC-MCFF-DC

2 *In MCFF ERU, stands managed for old growth are at least 100 to 300 acres in size. In addition,* Old growth structure occurs throughout the landscape, generally in small areas as individual old growth components or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris). The location of old growth components shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality). Old growth exhibits age-class and structural diversity and is often mixed with groups of younger trees or as individual groups of mostly old trees.

3 *In MCFF ERU*: *For areas outside of old growth areas,* Mixed Conifer with Frequent Fire is composed predominantly of vigorous trees, but declining trees are a component and provide for snags; top-killed, lightning-scarred, and fire-scarred trees; and coarse woody debris (greater than 3-inch diameter), all well distributed throughout the landscape. Snags, down logs, and coarse woody debris are representative of the species in this vegetation community. Snags are typically 18 inches and above at d.b.h. and, average 3 snags per acre. Downed logs (greater than 12-inch diameter at mid-point and greater than 8 feet long) average 3 per acre within forested areas. Coarse woody debris (greater than 3-inch diameter), including down logs, ranges from 5 to 15 tons per acres to maintain long-term soil productivity and provide wildlife habitat.

Stands managed for mixed conifer old growth follow Table A [Table F- 1] (Minimum Criteria for the Structural Attributes used to Determine Old Growth). *In old growth stands, minimum attributes for snags are: 14 to 16 inches diameter at breast height depending on site, 20 feet tall (low sites) to 25 feet tall (high sites) and there are at least 2.5 snags per acre. They meet the needs of species that use snags and provide for future downed logs. In old growth stands, minimum attributes for downed logs are: 12-inch diameter at mid-point and 16 feet long and there are at least 4 downed logs per acre. Coarse woody debris, including large downed logs, is sufficient to maintain or improve long-term soil productivity and provide important wildlife habitat. Minimal total basal area ranges between 80 to 100 square feet per acre depending on site productivity and minimum total canopy cover ranges between 50 and 60 percent.*

Standards for Mixed Conifer with Frequent Fire ERU

The following Standard will be added as part of alternative C:

FW-TerrERU-MC-MCFF-S

1 Allocate no less than 20 percent of *the Mixed Conifer with Frequent Fire ERU in each 6th code watershed* to old growth as depicted in the Table A [Table F- 1]. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth.*

Mixed Conifer with Infrequent Fire ERU Direction in Proposed Plan

The following adjustments will be applied to Mixed Conifer with Infrequent Fire ERU direction as part of alternative C:

Desired Conditions for Mixed Conifer with Infrequent Fire ERU

The following Desired Conditions will be modified as part of alternative C:

FW-TerrERU-MC-MCIF-DC

2 *In MCIF ERU, stands managed for old growth are at least 100 to 300 acres in size.* Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. Old growth components are generally concentrated in old growth stands and the location of old growth stands shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

3 Mixed Conifer with Infrequent Fire is composed predominantly of vigorous trees, but older declining trees are a component and provide for snags; top-killed, lightning-scarred and fire-scarred trees; and coarse woody debris, all well distributed throughout the landscape, *including in aspen stands*. *For areas outside of old growth stands,* number of snags and the amount of downed logs (greater than 12-inch diameter at mid-point and greater than 8 feet long) and coarse woody debris (greater than 3-inch diameter) vary by seral stage *(areas inside old growth stands are described in FW-TerrERU-MCIF-DC-6).*

6 *For areas outside of old growth areas:* Tree density ranges from 20 to 180 square foot basal area per acre depending upon age, site productivity, time since disturbance and seral stages of groups and patches. Forest conditions may exceed these densities in some areas, such as on steep slopes and in canyons. In addition, the density of larger trees and canopy cover may be higher where needed to manage for Mexican spotted owls. Snags 18 inches or greater at d.b.h. average from 1 to 5 snags per acre, with the lower range of snags of this size associated with early seral stages and the upper range associated with late seral stages. Snag density in general (greater than 8 inches d.b.h.) averages 20 per acre and provide wildlife habitat and future downed logs. Coarse woody debris, including downed logs, varies by seral stage, with averages ranging from 5 to 20 tons per acre for early seral stages; 20 to 40 tons per acre for mid-seral stages; and 35 tons per acre or greater for late-seral stages. Coarse woody debris and logs provide for long-term soil productivity.

Using Table A [Table F- 1]*. Minimum Criteria for the Structural Attributes Used to Determine Old Growth, in old growth stands, minimum attributes for snags are: 14 to 16 inches diameter*

at breast height depending on site, 20 feet tall (low sites) to 25 feet tall (high sites) and there are at least 2.5 snags per acre. They meet the needs of species that use snags and provide for future downed logs. In old growth stands, minimum attributes for downed logs are: 12 inch diameter at mid-point and 16 feet long and there are at least 4 downed logs per acre. Coarse woody debris, including large downed logs, is sufficient to maintain or improve long-term soil productivity and provide important wildlife habitat. Minimal total basal area ranges between 80 to 100 square feet per acre depending on site productivity and minimum total canopy cover ranges between 50 and 60 percent. Direction is the same as for MCFF.

Standards for Mixed Conifer with Infrequent Fire ERU

The following Standard will be added as part of alternative C:

FW-TerrERU-MC-MCIF-S

1 Allocate no less than 20 percent of the *Mixed Conifer with Infrequent Fire ERU in each 6th code watershed* to old growth as depicted in the Table A [Table F- 1]. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth.*

Spruce-Fir ERU Direction in Proposed Plan

The following adjustments will be applied to Spruce-Fir ERU direction as part of alternative C:

Desired Conditions for Spruce-Fir ERU

The following Desired Conditions will be modified as part of alternative C:

FW-TerrERU-SF-DC

2 *In Spruce Fir ERU, stands managed for old growth are at least 100 to 300 acres in size.* Old growth characteristics generally occur over large areas as stands or patches where old growth components are concentrated. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth components shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

3 Spruce Fir is composed predominantly of vigorous trees, but older declining trees are a component. Declining trees are well-distributed throughout the landscape, *including in aspen,* and provide for snags; top-killed, lightning-scarred and fire-scarred trees; and coarse woody debris. Number of snags and the amount of downed logs (greater than 12-inch diameter at mid-point and greater than 8 feet long) and coarse woody debris (greater than 3-inch diameter) vary by seral stage.

7 Tree density ranges from 20 to 250 square foot basal area per acre, depending upon disturbance and seral stages of the groups and patches. *For areas outside of old growth stands:* Snags 18 inches or greater at d.b.h. range from 1 to 3 snags per acre, with the lower range of snags this size associated with early seral stages and the upper range associated with late seral stages. Snag density in general (greater than 8 inches d.b.h.) averages 20 per acre with a range of 13 to 30 and provides habitat for wildlife species and future downed logs. Coarse woody debris, including downed logs, averages vary by seral stage, ranging from 5 to 30 tons per acre for early seral stages; 30 to 40 tons per acre for mid-seral stages; and 40 tons per acre or greater for

late-seral stages and provide for long-term soil productivity. Stands managed for spruce-fir old growth follow Table A [Table F- 1] (Minimum Criteria for the Structural Attributes used to Determine Old Growth). *In old growth stands, the minimum attributes for snags are: 12 to 16 inches diameter at breast height depending on site, 20 feet tall (low sites) to 30 feet tall (high sites) and there is at least 3 to 4 snags per acre. They meet the needs of species that use snags and provide for future downed logs. In old growth stands, minimum attributes for downed logs are: 12-inch diameter at mid-point and 16 feet long and there are at least 5 downed logs per acre. Coarse woody debris, including large downed logs, is sufficient to maintain or improve long-term soil productivity and provide important wildlife habitat. Minimal total basal area ranges between 120 to 140 square feet per acre depending on site productivity and minimum total canopy cover ranges between 60 and 70 percent.*

Standards for Spruce-Fir ERU

The following Standard will be added as part of alternative C:

FW-TerrERU-SF-S

1 Allocate no less than 20 percent of the *Spruce Fir ERU in each 6th code watershed* to old growth as depicted in the Table A [Table F- 1]. *Minimum Criteria for the Structural Attributes Used to Determine Old Growth.*

Management Areas

Pine Belt Management Area

The following adjustments will be applied to the Pine Belt Management Area direction as part of alternative C:

General Description and Background for Pine Belt Management Area

Characteristics of the Pine Belt Management Area in alternative C

Approximate acres: 457,189 acres of National Forest System land

Designated Wilderness

- Fossil Springs Wilderness
- Kendrick Mountain Wilderness
- Munds Mountain Wilderness
- Sycamore Canyon Wilderness
- West Clear Creek Wilderness
- Wet Beaver Wilderness

Wild and Scenic Rivers (designated)

- Fossil Creek (Wild)

Recommended Wilderness

- Deadwood Draw
- East Clear Creek
- Railroad
- Tin Can

Wild and Scenic Rivers (eligible)

- East Clear Creek (Scenic)
- Oak Creek (Recreational)
- West Clear Creek (Wild)
- West Fork Oak Creek (Wild)
- Wet Beaver Creek (Wild)

Inventoried Roadless Areas

- East Clear Creek

National Trails and Scenic Roads

- Arizona National Scenic Trail
- General George Crook National Recreation Trail
- Oak Creek Canyon Scenic Road
- Route 66 All-American Road
- San Francisco Peaks Scenic Road

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas

- G A Pearson Research Natural Area
- Red Mountain Geological Area

Terrestrial Ecological Response Units*

- Great Basin Grassland
- Interior Chaparral
- Montane Subalpine Grassland
- Pinyon Juniper with Grass
- Pinyon Juniper Evergreen Shrub
- Pinyon Juniper Woodland
- Ponderosa Pine
- Mixed Conifer with Frequent Fire
- Mixed Conifer with Infrequent Fire
- Spruce Fir

Riparian Areas

- Wetlands
- Springs
- Streams

Riparian Forest Types*

- Cottonwood Willow Riparian Forest
- Mixed Broadleaf Deciduous Forest
- Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

See also Suitable Uses in Chapter 4

Adjoins Anderson Mesa, Blue Ridge, East Clear Creek, Flagstaff Neighborwoods, Jack's Canyon, Long Valley, Oak Creek Canyon, Pine Grove, Red Rock, San Francisco Peaks, Verde Valley, and Volcanic Woodlands Management Areas

Desired Conditions for Pine Belt Management Area

MA-PineBelt-DC

The following desired conditions will be added as part of alternative C:

9 *Canyons and steep slopes in this MA provide solitude and more primitive non-motorized recreation opportunities. These areas also provide low-disturbance wildlife habitat.*

San Francisco Peaks Management Area

The following adjustments will be applied to the San Francisco Peaks Management Area direction as part of alternative C:

General Description and Background for San Francisco Peaks Management Area

Characteristics of the San Francisco Peaks Management Area in alternative C

Approximate acres: 58,919 acres of National Forest System land

Designated Wilderness

Kachina Peaks Wilderness

Wild and Scenic Rivers (designated): None

Recommended Wilderness

Abineau

Wild and Scenic Rivers (eligible): None

Inventoried Roadless Areas: None

National Trails and Scenic Roads

Arizona National Scenic Trail
San Francisco Peaks Scenic Road

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas

Fern Mountain Botanical Area

San Francisco Peaks Research Natural Area

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Montane Subalpine Grassland

Pinyon Juniper with Grass

Pinyon Juniper Woodland

Ponderosa Pine

Mixed Conifer with Frequent Fire

Mixed Conifer with Infrequent Fire

Spruce Fir

Alpine Tundra

Riparian Areas

Springs
Streams

Riparian Forest Types

Montane Willow Riparian Forest

*ERUs and Riparian Forest Types were generated using forest-level data and need to be validated at the project level.

Adjoins Flagstaff Neighborwoods, Fort Valley/Mt. Elden, Pine Belt, and Volcanic Woodlands Management Areas

Desired Conditions for San Francisco Peaks Management Area

MA-Peaks-DC

The following desired conditions will be added as part of alternative C:

7 *The Inner Basin area of the San Francisco Peaks provides a sustainable mix of dispersed and developed recreational opportunities in balance with functioning watershed, soil, and vegetative conditions.*

8 *Steep slopes and other hard to access areas in the Inner Basin area of the San Francisco Peaks provide solitude and more primitive non-motorized recreation opportunities. These areas also provide low disturbance wildlife habitat.*

The following desired condition will be modified as part of alternative C:

4 The Waterline Road (Forest Road 146), *Forest Road 6437, and the portion of Forest Road 553 from Lockett Meadow to the Waterline Road provide* access for the City of Flagstaff to operate and maintain the Inner Basin municipal water supply and associated infrastructure.

Standard for San Francisco Peaks Management Area

MA-Peaks-S

The following standard will be added as part of alternative C:

4 *Recreational livestock use such as horses, pack stock, mules, or llamas are not permitted in the Inner Basin area above the watershed cabin.*

Guidelines for San Francisco Peaks Management Area

MA-Peaks-G

The following guidelines will be added as part of alternative C:

3 *To limit motorized intrusion into wilderness and to protect the watersheds, motorized access should be restricted to authorized vehicles necessary for area administration on the Waterline Road (Forest Road 146), Forest Road 6437, and the portion of Forest Road 553 from Lockett Meadow to the Waterline Road.*

4 *Vegetation treatments in the Inner Basin area should only be planned when needed by other resources, or to control significant insect or disease outbreaks.*

5 *Dispersed recreation in the Inner Basin area should be limited* day-use traffic, by foot or bicycle, to maintain water quality and watershed function.

Management Approach for San Francisco Peaks Management Area

The following management approach will be added as part of alternative C:

Continue to work with City of Flagstaff to minimize impacts to forest resources and to rehabilitate impacted areas.

Flagstaff Neighborwoods Management Area

The following adjustments will be applied to the Flagstaff Neighborwoods Management Area direction as part of alternative C:

General Description and Background for Flagstaff Neighborwoods Management Area

Characteristics of the Flagstaff Neighborwoods Management Area in alternative C

Approximate acres: 58,267 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible) None

Inventoried Roadless Areas: None

National Trails and Scenic Roads

- Arizona National Scenic Trail
- Route 66 All-American Road
- San Francisco Peaks Scenic Road

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas

- Elden Environmental Study Area
- G A Pearson Research Natural Area
- Griffith Springs Environmental Study Area
- Old Caves Crater Environmental Study Area

Terrestrial Ecological Response Units*

- Great Basin Grassland
- Montane Subalpine Grassland
- Pinyon Juniper with Grass
- Pinyon Juniper Woodland
- Ponderosa Pine
- Mixed Conifer with Frequent Fire

Riparian Areas

- Wetlands
- Springs
- Streams

Riparian Forest Types*

- Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

See also Suitable Uses in Chapter 4

Adjoins Anderson Mesa, Fort Valley/Mt Elden, Pine Belt, San Francisco Peaks, Volcanic Woodlands, and Walnut Canyon Management Areas.

Desired Conditions for Flagstaff Neighborwoods Management Area

MA-FlagN-DC

The following desired condition will be added as part of alternative C:

8 *Canyons and steep slopes in this MA provide solitude and more primitive non-motorized recreation opportunities. These areas also provide low-disturbance wildlife habitat.*

Walnut Canyon Management Area

The following adjustments will be applied to the Walnut Canyon Management Area direction as part of alternative C:

General Description and Background for Walnut Canyon Management Area

Characteristics of the Walnut Canyon Management Area in alternative C

Approximate acres: 22,336 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible): None

Inventoried Roadless Areas: None

National Trails and Scenic Roads

Arizona National Scenic Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Great Basin Grassland

Montane Subalpine Grassland

Pinyon Juniper with Grass

Pinyon Juniper Woodland

Ponderosa Pine

Riparian Areas

Springs

Streams

Riparian Forest Types*

Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

A*djoins Anderson Mesa, Flagstaff Neighborwoods, and Pine Belt Management Areas.*

Desired Conditions for Walnut Canyon Management Area

MA-Walnut-DC

The following desired condition will be added as part of alternative C:

3 *Canyons and steep slopes in this MA provide solitude and more primitive non-motorized recreation opportunities. These areas also provide low disturbance wildlife habitat.*

Anderson Mesa Management Area

The following adjustments will be applied to the Anderson Mesa Management Area direction as part of alternative C:

General Description and Background for Anderson Mesa Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Anderson Mesa MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Anderson Mesa Management Area in alternative C

Approximate acres: 257,338 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible)

East Clear Creek (Scenic)

Inventoried Roadless Areas

Padre Canyon

National Trails and Scenic Roads

Arizona National Scenic Trail

Route 66 All-American Road

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Great Basin Grassland

Montane Subalpine Grassland

Pinyon Juniper with Grass

Pinyon Juniper Woodland

Ponderosa Pine

Mixed Conifer with Infrequent Fire

Riparian Areas

Wetlands

Springs

Streams

Riparian Forest Types*

Montane Willow Riparian Forest

Mixed Broadleaf Deciduous Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins East Clear Creek, Flagstaff Neighborwoods, Jack's Canyon, Long Valley, Pine Belt, Volcanic Woodlands, and Walnut Canyon Management Areas.

Desired Conditions for Anderson Mesa Management Area

MA-AMesa-DC

The following desired conditions will be removed from the proposed plan as part of alternative C:

MA-AMesa-DC-1, MA-AMesa-DC-2, MA-AMesa-DC-3, MA-AMesa-DC-4, MA-AMesa-DC-5

The following Desired Conditions will be added as part of alternative C:

1 *In the Anderson Mesa MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *The watersheds that support Mormon, Young's, Padre, and Anderson Canyons are protected and restored.*

10 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

11 *In the Anderson Mesa MA, Mexican spotted owl, Northern goshawk, mountain lion, Abert's squirrel, pronghorn, cinnamon teal, aquatic macro-invertebrates, mule deer, Gunnison prairie dog and associated community, migratory wetland birds, Yellow-breasted chat, and the Lincoln sparrow are emphasized and able to find properly functioning and restored habitats.*

12 *Pine stringers, grasslands, wetlands, and the Pinyon Juniper ERUs are important habitat features in this MA. The understory is diverse and provides hiding cover for pronghorn fawns. Forbs and shrubs provide forage for mule deer and pronghorn.*

13 *Canyons and steep slopes in this MA provide solitude and more primitive non-motorized recreation opportunities. These areas also provide low disturbance wildlife habitat.*

Guidelines for Anderson Mesa Management Area

MA-AMesa-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Roads that provide public access should be limited in order to minimize impacts from motorized vehicle traffic to wildlife species and habitats emphasized in this MA.*

3 *Through future projects and other actions, public road density throughout this MA should not exceed an average of 1 mile of road per square mile.*[1]

4 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approach for Anderson Mesa Management Area

The following management approach will be added as part of alternative C:

[1] Road density should be based on the ratio between roads open to public access and acres of Forest Service-managed lands for Anderson Mesa MA. This ratio should be calculated at the MA level not at the site specific and project level scales.

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Pine Grove Management Area

The following adjustments will be applied to the Pine Grove Management Area direction as part of alternative C:

General Description and Background for Pine Grove Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Pine Grove MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Pine Grove Management Area in alternative C

Approximate acres: 13,601 acres of National Forest System land

Special Areas may overlap

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible): None

Inventoried Roadless Areas: None

National Trails and Scenic Roads

Arizona National Scenic Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Great Basin Grassland

Montane Subalpine Grassland

Ponderosa Pine

Riparian Areas

Wetlands

Springs

Streams

Riparian Forest Types*

Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins the Pine Belt Management Area.

Desired Conditions for Pine Grove Management Area

MA-PGrove-DC

The following desired conditions will be added as part of alternative C:

1 *In the Pine Grove MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

10 *In the Pine Grove MA, Mexican spotted owl, northern goshawk, mountain lion, and the Abert's squirrel are emphasized and able to find properly functioning and restored habitat. This MA also offers protection for the Upper Lake Mary watershed.*

11 *Pine Grove Seasonal Closure Area provides opportunities for recreation in a back country area that has a low concentration of users and a high degree of interaction with the natural environment that is seasonally undisturbed by vehicles. The area is largely unfragmented and natural appearing. There is little evidence of resource modification. This area provides wildlife with an environment that has reduced disturbance from motorized vehicles compared to surrounding areas.*

Standards for Pine Grove Management Area

MA-PGrove-S

The following standard will be added as part of alternative C:

1 *Pine Grove Seasonal Closure Area shall be closed to motor vehicle use from August 15 to December 31. Roads within the area are closed, but the roads along the perimeter are open to motorized travel. The purpose of the closure is to provide opportunities for recreation in areas undisturbed by vehicles.*

Guidelines for Pine Grove Management Area

MA-PGrove-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Public motor vehicle access should not be provided to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. Roads within this MA should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Pine Grove Management Area

The following management approach will be added as part of alternative C:

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Long Valley Management Area

The following adjustments will be applied to the Long Valley Management Area direction as part of alternative C:

General Description and Background for Long Valley Management Area

Characteristics of the Long Valley Management Area in alternative C

Approximate acres: 173,655 acres of National Forest System land

Designated Wilderness

West Clear Creek Wilderness

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible)

West Clear Creek (Wild)

Inventoried Roadless Areas: None

National Trails and Scenic Roads

Arizona National Scenic Trail
General George Crook National Recreation Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas

Rocky Gulch Research Natural Area

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Great Basin Grassland
Montane Subalpine Grassland
Pinyon Juniper Evergreen Shrub
Pinyon Juniper Woodland
Ponderosa Pine
Mixed Conifer with Frequent Fire
Mixed Conifer with Infrequent Fire

Riparian Areas

Wetlands
Springs
Streams

Riparian Forest Types*

Mixed Broadleaf Deciduous Forest
Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins Anderson Mesa, Blue Ridge, and Pine Belt Management Areas

Jack's Canyon Management Area

The following adjustments will be applied to the Jack's Canyon Management Area direction as part of alternative C:

General Description and Background for Jack's Canyon Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Jack's Canyon MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Jack's Canyon Management Area in alternative C

Approximate acres: 16,931 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible): None

Inventoried Roadless Areas

Jacks Canyon

Lower Jacks Canyon

National Trails and Scenic Roads

Arizona National Scenic Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Great Basin Grassland

Pinyon Juniper with Grass

Pinyon Juniper Woodland

Ponderosa Pine

Riparian Areas

Springs
Streams

Riparian Forest Types*

Mixed Broadleaf Deciduous Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins Anderson Mesa and Pine Belt MAs.

Desired Conditions for Jack's Canyon Management Area

MA-Jack-DC

The following desired conditions will be added as part of alternative C:

1 *In the Jack's Canyon MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Jack's Canyon MA offers long-term protection of river and stream corridors. Habitat for the Mexican spotted owl, northern goshawk, black bear, mountain lion, Abert's squirrel, and pronghorn are emphasized.*

10 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

Guidelines for Jack's Canyon Management Area

MA-Jack-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Roads that provide public motorized access should be limited in order to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. In Jack's Canyon MA, public motorized access should be provided on and limited to roads that access developed sites, trailheads, and interpretive sites. Roads that do not provide this access or connectivity should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Jack's Canyon Management Area

The following management approach will be added as part of alternative C:

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

East Clear Creek Management Area

The following adjustments will be applied to the East Clear Creek Management Area direction as part of alternative C:

General Description and Background for East Clear Creek Management Area

Characteristics of the East Clear Creek Management Area in alternative C

Approximate acres: 41,735 acres of National Forest System land

Special Areas may overlap

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness

- Barbershop
- East Clear Creek

Wild and Scenic Rivers (eligible)

- East Clear Creek (Scenic)
- Leonard Canyon (Recreational)
- Barbershop (Wild)

Inventoried Roadless Areas

- Barbershop Canyon (Wild)
- East Clear Creek (Scenic)

National Trails and Scenic Roads

- Arizona National Scenic Trail

See also Suitable Uses in Chapter 4

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

Terrestrial Ecological Response Units*

- Montane Subalpine Grassland
- Pinyon Juniper Woodland
- Ponderosa Pine
- Mixed Conifer with Frequent Fire

Riparian Areas

- Wetlands
- Springs
- Streams

Riparian Forest Types*

- Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

A*djoins Anderson Mesa, Blue Ridge, Hospital Ridge, Limestone Pasture, Second Chance, and Pine Belt Management Areas.*

Desired Conditions for East Clear Creek Management Area

The following desired conditions will be removed from the proposed plan as part of alternative C:

MA-EastClr-DC-1, MA-EastClr-DC-3

The following desired conditions will be added as part of alternative C:

1 *In the East Clear Creek MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *East Clear Creek MA offers long-term protection of river and stream corridors. Habitat for the Little Colorado spinedace, northern and Chiricahua leopard frogs, beaver, Mexican spotted owl, northern goshawk, black bear, mountain lion, Abert's squirrel, mule deer, elk, forest-dependent birds, and turkey are emphasized and able to find properly functioning and restored habitat.*

10 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

Guidelines for East Clear Creek Management Area

MA-EastClr-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Roads that provide public motorized access should be limited in order to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. In East Clear Creek MA, public motorized access should be provided on and limited to roads that access developed sites, trailheads, and interpretive sites. Roads that do not provide this access or connectivity should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for East Clear Creek Management Area

Coordinate with the Salt River Project, National Forest Foundation, Town of Payson, and the Bureau of Reclamation, U.S. Fish and Wildlife Service, Arizona Game and Fish Department, Arizona Elk Society, the local community, and other stakeholders to proactively improve the health and resiliency of the watersheds associated with C.C. Cragin Reservoir.

Second Chance Management Area

The following adjustments will be applied to the Second Chance Management Area direction as part of alternative C:

General Description and Background for Second Chance Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Second Chance MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Second Chance Management Area in alternative C

Approximate acres: 1,444 acres of National Forest System land

Special Areas may overlap

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible): None

Inventoried Roadless Areas: None

National Trails and Scenic Roads: None

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

Terrestrial Ecological Response Units*

Ponderosa Pine

Riparian Areas:

Streams

Riparian Forest Types*: None

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

See also Suitable Uses in Chapter 4

Adjoins the East Clear Creek Management Area.

Desired Conditions for Second Chance Management Area

MA-ScndChnc-DC

The following desired conditions will be added as part of alternative C:

1 *In the Second Chance MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen and big tooth maple are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

10 *Within the Second Chance MA, the watersheds that support Leonard Canyon and East Clear Creek, including the headwaters, are protected and restored.*

11 *In the Second Chance MA, northern Goshawk is emphasized and able to find properly functioning and restored habitat. The Upper Clear Creek watershed, native vegetation, and soils of this headwater region are protected and properly functioning within the boundaries of the MA.*

Guidelines for Second Chance Management Area

MA-ScndChnc-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Public motor vehicle access should not be provided to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. Roads within this MA should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Second Chance Management Area

The following management approaches will be added as part of alternative C:
Management Approach as part of alternative C

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Blue Ridge Management Area

The following adjustments will be applied to the Blue Ridge Management Area direction as part of alternative C:

General Description and Background for Blue Ridge Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Blue Ridge MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Blue Ridge Management Area in alternative C

Approximate acres: 36,006 acres of National Forest System land

Special Areas may overlap

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible)

East Clear Creek (Scenic)

Barbershop Canyon (Wild)

Inventoried Roadless Areas: None

National Trails and Scenic Roads

Arizona National Scenic Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Montane Subalpine Grassland

Ponderosa Pine

Mixed Conifer with Frequent Fire

Riparian Areas

Wetlands

Springs

Streams

Riparian Forest Types*

Cottonwood Willow Riparian Forest

Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins East Clear Creek, Pine Belt, and Long Valley Management Areas.

Desired Conditions for Blue Ridge Management Area

MA-BlueRidge-DC

The following Desired Conditions will be added as part of alternative C:

1 *In the Blue Ridge MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen and big tooth maple are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Within the Blue Ridge MA, the watersheds that support Leonard Canyon and East Clear Creek, including the headwaters, are protected and restored.*

10 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

11 *In the Blue Ridge MA, Little Colorado spinedace, northern and Chiricahua leopard frogs, beaver, Mexican spotted owl, northern goshawk, black bear, mountain lion, Abert's squirrel, mule deer, elk, forest-dependent birds, and turkey are emphasized and able to find properly functioning and restored habitat.*

Guidelines for Blue Ridge Management Area

MA-BlueRidge-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Roads that provide public motorized access should be limited in order to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. In Blue Ridge MA, public motorized access should be provided on and limited to roads that access developed sites, trailheads, and interpretive sites, roads that provide recreation access to the C. C. Cragin Reservoir, and improved and maintained roads providing connectivity from State Highway 87 to the Rim Road (FR 300). Roads that do not provide this access or connectivity should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Blue Ridge Management Area

The following management approach will be added as part of alternative C:

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Limestone Pasture Management Area

The following adjustments will be applied to the Limestone Pasture Management Area direction as part of alternative C:

General Description and Background for Limestone Pasture Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Limestone Pasture MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Limestone Pasture Management Area in alternative C

Approximate acres: 2,418 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible)

Leonard Canyon (Recreational)

Inventoried Roadless Areas: None

National Trails and Scenic Roads: None

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Ponderosa Pine

Mixed Conifer with Frequent Fire

Riparian Areas

Springs
Streams

Riparian Forest Types*

Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins the East Clear Creek Management Area.

Desired Conditions for Limestone Pasture Management Area

MA-Limestone-DC

The following Desired Conditions will be added as part of alternative C:

1 *In the Limestone Pasture MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen and big tooth maple are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

10 *Within the Limestone Pasture MA, the watersheds that support Leonard Canyon and East Clear Creek, including the headwaters, are protected and restored.*

11 *In the Limestone Pasture MA, Black bear, mountain lion, northern goshawk, and Abert's squirrel are emphasized and able to find properly functioning and restored habitat.*

12 *The Upper Clear Creek watershed, native vegetation, and soils of this headwater region are protected and properly functioning within the boundaries of the MA.*

Guidelines for Limestone Pasture Management Area

MA-Limestone-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Public motor vehicle access should not be provided to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. Roads within this MA should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Limestone Pasture Management Area

The following management approach will be added as part of alternative C:

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Hospital Ridge Management Area

The following adjustments will be applied to* the Hospital Ridge Management *Area direction as part of alternative C:

General Description and Background for Hospital Ridge Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Hospital Ridge MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Hospital Ridge Management Area in alternative C

Approximate acres: 5,026 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible)

Leonard Canyon (Recreational)

Inventoried Roadless Areas: None

National Trails and Scenic Roads

General George Crook National Recreation Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

See also Suitable Uses in Chapter 4

Terrestrial Ecological Response Units*

Ponderosa Pine

Mixed Conifer with Frequent Fire

Montane Subalpine Grassland

Riparian Areas

Wetlands

Springs

Streams

Riparian Forest Types*

Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

Adjoins East Clear Creek and Knoll Lake Management Areas.

Desired Conditions for Hospital Ridge Management Area

MA-HospRdg-DC

The following Desired Conditions will be added as part of alternative C:

1 *In the Hospital Ridge MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen and big tooth maple are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

10 *Within the Hospital Ridge MA, the watersheds that support Leonard Canyon and East Clear Creek, including the headwaters, are protected and restored.*

11 *In the Hospital Ridge MA, Little Colorado spinedace, Mexican spotted owl, northern goshawk, black bear, mountain lion, and Abert's squirrel are emphasized and able to find properly functioning and restored habitats.*

12 *This MA provides protection for the health and functioning of the Upper Clear Creek watershed, West and Middle Leonard Canyons, and adjoining riparian ecosystems.*

Guidelines for Hospital Ridge Management Area

MA-HospRdg-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Public motor vehicle access should not be provided to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. Roads within this MA should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Hospital Ridge Management Area

The following management approach will be added as part of alternative C:

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Knoll Lake Management Area

The following adjustments will be applied to the Knoll Lake Management Area direction as part of alternative C:

General Description and Background for Knoll Lake Management Area

The following general description and background will be added as part of alternative C:

Roads on the boundaries of the Knoll Lake MA and those listed in desired conditions provide access and are excluded from motor vehicle traffic restrictions.

Characteristics of the Knoll Lake Management Area in alternative C

Approximate acres: 2,607 acres of National Forest System land

Designated Wilderness: None

Wild and Scenic Rivers (designated): None

Recommended Wilderness: None

Wild and Scenic Rivers (eligible):
Leonard Canyon (Recreation)

Inventoried Roadless Areas: None

National Trails and Scenic Roads:
General George Crook National Recreation Trail

Research Natural Areas, Botanical and Geological Areas, Environmental Study Areas: None

Terrestrial Ecological Response Units*
Mixed Conifer with Frequent Fire

Riparian Areas:
Springs
Streams

Riparian Forest Types*:
Montane Willow Riparian Forest

*ERUs and Riparian forest types were generated using forest-level data and need to be validated at the project level.

See also Suitable Uses in Chapter 4

Adjoins East Clear Creek and Hospital Ridge Management Areas.

Desired Conditions for Knoll Lake Management Area

MA-KnollLake-DC

The following Desired Conditions will be added as part of alternative C:

1 *In the Knoll Lake MA, the ecological integrity of watersheds, headwater environments, native vegetation, and soils is intact and functioning properly.*

2 *Streams and perennial waters support identified designated beneficial uses.*

3 *Springs, streams, and wetlands are protected and restored.*

4 *Old growth in the Ponderosa Pine and Mixed Conifer ERUs is protected during management activities. Old growth stands and riparian corridors found within this MA provide biologically significant cores and corridors for wildlife and fish through the landscape.*

5 *Wildlife habitats are properly functioning and the understory provides sufficient habitat and cover for wildlife.*

6 *Natural fire regimes are established in appropriate soil and vegetation types. Fire management mimics natural fire processes.*

7 *Evidence of past logging is negligible and few roads are present.*

8 *Stands of aspen and big tooth maple are present and properly functioning, adding value to both habitat diversity and scenic integrity.*

9 *Recreation activities are predominantly low-disturbance and non-motorized and include wildlife watching, birding, fishing, hunting, horseback riding, mountain-biking, and hiking. Recreation does not negatively impact soil conditions, hydrologic flow, or habitat connectivity.*

10 *Within the Knoll Lake MA, the watersheds that support Leonard Canyon and East Clear Creek, including the headwaters, are protected and restored.*

11 *In the Knoll Lake MA, Little Colorado spinedace, Mexican spotted owl, northern goshawk, black bear, mountain lion, and Abert's squirrel are emphasized and able to find properly functioning and restored habitats.*

12 *The East Clear Creek watershed and East Leonard Canyon ecosystem are protected and properly functioning within the boundaries of the MA.*

Guidelines for Knoll Lake Management Area

MA-KnollLake-G

The following guidelines will be added as part of alternative C:

1 *There should be no net increase in the area of motorized dispersed camping corridors designated within this MA. The purpose is to limit soil, vegetation, and noise disturbances to wildlife species and habitat emphasized within this MA.*

2 *Roads that provide public motorized access should be limited in order to minimize impacts from vehicle traffic to wildlife species and habitats emphasized in this MA. In Knoll Lake MA, public motorized access should be provided on and limited to roads that access developed sites, trailheads, and interpretive sites. Roads that do not provide this access or connectivity should be managed for administrative use or decommissioned.*

3 *To avoid impacts to wildlife and associated habitats, large group recreation events and large commercial tours within this MA should not be permitted except in developed sites. This does not apply to activities in support of research.*

Management Approaches for Knoll Lake Management Area

The following management approach will be added as part of alternative C:

Collaborate with interested groups to monitor the wildlife species and habitat emphasized in this management area.

Special Areas

Recommended Wilderness Areas

In addition to the recommended wilderness areas in alternative B (modified) (Abineau, Strawberry Crater Addition, and Davey's), alternative C includes 10 additional recommended wilderness areas (Barbershop, Black Mountain, Cedar Bench, Cimarron-Boulder, Deadwood Draw, East Clear Creek, Hackberry, Railroad Draw, Tin Can, and Walker Mountain).

Established and Proposed Research Natural Areas and Botanical and Geological Areas

Guidelines for Established and Proposed Research Natural Areas and Designated Botanical and Geological Areas

SA-RNABotGeo-G

The following guideline will be replaced with the below text as part of alternative C:

4 *Livestock grazing should be excluded from research natural areas unless grazing supports or would not affect the area's research purpose.*

Cottonwood Basin Botanical Area

This botanical area has been incorporated into alternative B (modified).

Suitable Uses

Recreation and Transportation Suitability

Under alternative C, Table 2 [Table F- 2] was modified to add suitability determinations for the seven additional management areas, as well as the modified Anderson Mesa MA. Alternative C also makes suitability determinations for recreational shooting and snowmobile use. Table 3 [Table F- 3] displays those suitability determinations. Recreational shooting is target shooting, not shooting for hunting.

Unlike alternative B (modified), alternative C retained the determination that mechanized travel in botanical and geological areas would not be suitable.

Table 2 [Table F- 2]. Alternative C recreation and transportation suitability[1]

Recreation Opportunity Spectrum (ROS), Special Areas, and select Management Areas	New Motorized Areas	Permanent Roads	Temporary Roads	Motorized Trails	Mechanized Travel	Non-Motorized Travel
Urban and Rural ROS	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Roaded Natural ROS	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Semi-primitive Motorized ROS	Not Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Semi-primitive Non-motorized ROS	Not Suitable	Not Suitable	Suitable	Not Suitable	Suitable	Suitable
Primitive ROS	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable	Suitable
Recommended Research Natural Area	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable
Research Natural Area	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable
Botanical and Geological Areas	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable
Environmental Study Areas	Not Suitable	Not Suitable	Suitable	Not Suitable	Suitable	Suitable
Recommended Wilderness	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable	Suitable
Wilderness	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable
Eligible or Designated WSR – Recreation and Scenic	Not Suitable	Suitable	Suitable	Suitable	Suitable	Suitable
Eligible or Designated WSR – Wild	Not Suitable	Not Suitable	Not Suitable	Not Suitable	Suitable	Suitable
Anderson Mesa, Blue Ridge, Hospital Ridge, Jack's Canyon, Knoll Lake, Limestone Pasture, Pine Grove, and Second Chance Management Areas	***Not Suitable***	***Suitable***	***Suitable***	***Not Suitable***	***Suitable***	***Suitable***

[1] Table changes based on alternative C guidance are noted in ***bolded italics.***

Table 3 [Table F- 3]. Alternative C recreational shooting[1] and snowmobile use suitability

Recreation Opportunity Spectrum (ROS) and Special Area Designations	Recreational Shooting	Snowmobile Use
Urban and Rural ROS	Suitable	Suitable
Roaded Natural ROS	Suitable	Suitable
Semi-primitive Motorized ROS	Suitable	Suitable
Semi-primitive Non-motorized ROS	Suitable	Not Suitable
Primitive ROS	Suitable	Not Suitable
Recommended Research Natural Area	Not Suitable	Apply suitability determination for ROS
Research Natural Area	Not Suitable	Apply suitability determination for ROS
Botanical and Geological Areas	Not Suitable	Apply suitability determination for ROS
Recommended Wilderness	Suitable	Apply suitability determination for ROS
Wilderness	Suitable	Apply suitability determination for ROS
Eligible or suitable wild and scenic river	Suitable	Apply suitability determination for ROS
Anderson Mesa, Blue Ridge, Hospital Ridge, Jack's Canyon, Knoll Lake, Limestone Pasture, Pine Grove, and Second Chance Management Areas	Not Suitable	Apply suitability determination for ROS
Walnut Canyon MA	Not Suitable	Not Suitable
Sedona Neighborwoods MA	Not Suitable	Apply suitability determination for ROS
Flagstaff Neighborwoods MA	Suitable[2]	Apply suitability determination for ROS
Long Valley MA	Not Suitable	Apply suitability determination for ROS

[1] Recreational shooting refers to target shooting; it does not include shooting for hunting.

[2] Parts of the Flagstaff Neighborwoods in proximity to private property may not be suitable for recreational shooting. This determination should be made through project-level NEPA.

Glossary

Changes to Glossary in the Proposed Plan

Addition: Allocation - *The assignment of management prescriptions to particular land areas to achieve the goals and objectives of an alternative.*

Alternative D

Alternative D responds to public comments for no additional wilderness areas and for biking in botanical and geological areas. Alternative D also responds to issues regarding future energy corridor expansion needs.

This alternative includes:

- adjustment to Scenic Resources direction to accommodate future energy corridor expansion;
- no recommended wilderness areas;
- no Cottonwood Basin Botanical Area; and
- a determination that mechanized travel on designated trails in botanical and geological areas is suitable.

If alternative D is selected, the following plan changes would be made:

Scenic Resources

Management Approach for Scenic Resources

The following management approach will be added as part of alternative C:

> *When management activities or permitted uses conflict with high or very high scenery integrity objectives, work with proponents to find a location with a moderate scenery integrity objective or lower.*

Scenic Integrity Map

If alternative D is selected, Map 28 in the FEIS would replace Map 13 in the proposed plan. Map 28 indicates that the scenic integrity objective for the powerline corridor between Sycamore and Red Rock Secret Mountain Wilderness would change from moderate SIO to low SIO. This change would apply to approximately 21 miles of utility corridor from the headwaters of West Fork Oak Creek to the Verde River south of Black Mountain. In addition, the scenic integrity objectives would change from moderate or high SIO to low SIO along a portion of the energy corridor along State Highway 87. This change would apply to approximately 11 miles of utility corridor that runs parallel to State Highway 87 from the western forest boundary until the utility corridor crosses State Highway north of FR9731J. See Map 28 in Appendix A of the Final Environmental Impact Statement. These two changes would result in about 2,495 more acres of low SIO, between Sycamore and Red Rock Secret Mountain Wilderness and along State Highway 87.

Recommended Wilderness

Alternative D does not include any recommended wilderness areas.

Cottonwood Basin Botanical Area

Alternative D does not include the Cottonwood Basin Botanical Area; however like alternatives B (modified) and C, it does include the Cottonwood Basin Geological Area.

Recreation and Transportation Suitability Table

The determination that mechanized travel on designated trails in botanical and geological areas is suitable has been incorporated into alternative B (modified). See Table 14. Recreation and Transportation Suitability Table for Alternative B (modified) for the recreation and transportation suitability determinations applicable to alternative D.

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Appendix G. Timber Sale Schedule, Financial Evaluation, Allowable Sale Quantity, Long-term Sustained Yield, and Timber Suitability Calculation

Timber Suitability Calculation

The National Forest Management Act (NFMA) requires the agency to determine the suitability of National Forest System (NFS) lands for timber production and has specific requirements for timber suitability analysis in land management plans. The agency makes a distinction between timber harvest as a resource use (hereinafter called, timber production) and timber harvest as a management tool to achieve desired conditions; definitions are provided in the following discussion.

Determining Lands Tentatively Suitable for Timber Production

All lands administered by the Coconino NF were subjected to an analysis process that first identifies lands tentatively suitable for timber production (USDA Forest Service 2012a):

- Categorical filters are applied to identify "lands tentatively suitable for timber production." Lands that meet the following criteria are removed from the total acres of the forest (see Table G-1):
    - Non-forested lands
    - Lands where timber production would cause irreversible resource damage
    - Lands that cannot be adequately restocked
    - Lands that have been administratively withdrawn
- "Lands tentatively suitable for timber production" are then reviewed to determine whether they are "suitable for timber production" or "not suitable for timber production." These suitability determinations may vary by forest plan alternative. Analysis of alternatives allows the responsible official to identify where timber production is compatible with the desired conditions resulting from the land management planning process. The timber production objective is defined as growing, tending, harvesting, and regenerating crops of trees on a regulated basis to produce logs or other products for industrial or consumer use [1982 rule provisions section 219.16].
- Lands are identified as "suitable for timber production" if meeting and sustaining desired conditions and objectives would involve planned, periodic timber harvest activities and include planned regeneration of the stand. Timber production may not be a key management objective for the area. However, if periodic forest harvest and regeneration would either be consistent with or necessary for achieving and maintaining land management goals and desired conditions (fuels conditions, wildlife habitat, etc.), these lands should be classified as suitable for timber production. Designation of "Lands Suitable for Timber Production" does not imply that management would be focused on maximizing timber yields, only that periodic harvests are expected to occur as a tool for meeting land condition outcomes.
- "Lands not suitable for timber production" are determined through the forest plan analysis of alternatives process. These are lands where periodic timber harvest (timber production) is

unpredictable, unnecessary, or undesirable to achieve management goals, but harvest is permitted where necessary to achieve plan or project-level resource objectives. Timber harvest is not scheduled as a periodic activity on these lands, and, as such, is not included in the Long-term Sustained Yield Capacity (LTSYC) and Allowable Sale Quantity (ASQ) calculations do not apply.

Timber components codes (TimCo), vegetation cover type from the vegetation GIS layer, and existing wilderness areas were used to classify lands into the five categories of lands Not Suitable for Timber Production (Table G-1). These codes are assigned to each stand in the vegetation database and identify areas of suitability or non-suitability for timber management, in addition to areas of management for activities other than timber management. Some stands in the GIS database lack TimCo values because insufficient information is available. These stands represent approximately 0.2 percent of the Coconino NF. Typically, the stands are less than 1 acre in size and are the result of misaligned boundaries between multiple spatial databases. New TimCo values may be assigned at a later date when better, site-specific information becomes available. The Coconino NF has updated this database, since the 1987 plan was approved, where changes in management or site-specific analysis indicated a need to change the suitability designation.

Table G-1. Categories of lands not suitable for timber production and the specific attributes used to classify these categories

Not Suitable Category	TimCo	Description
Non-forest Lands	001	Water
	100	Water
	200	Non-Forest
	900	Non-Industrial Wood - Incapable of Producing Industrial Wood
	950	Non-Industrial Wood - Suitable Woodland
	960	Non-Industrial Wood - Suitable Woodland - Other Resource Emphasis
	970	Non-Industrial Wood - Woodland Not Suited for Management
Withdrawn Lands	300	Existing Wilderness Areas
	301	Unsuitable Forest Land - Wilderness
	302	Unsuitable Forest Land - Research Natural Areas
	303	Withdrawn - Other
	400	Pending Final Legislative Action
Irreversible Resource Damage	700	Unsuitable Forest Land - Timberland
	720	Current Techniques Prevent Harvesting (e.g., steep slopes)
	730	Irreversible Resource Damage (e.g., soil loss)
	740	Lacking Response Data
Adequate Restocking not Assured	710	Restocking Not Assured Within 5 Years (e.g., naturally open areas due to microclimates)
	Null	Private Land or Lacking Data

Table G-2 lists the acres removed from the Coconino NF-managed land base, by land category, to determine the “Lands Tentatively Suitable for Timber Production.” Because the lands in these

categories have physical or regulatory limitations that apply regardless of how the lands may be managed, the acres in these categories do not vary by alternative. The next categorical filter in this process, to determine "Tentatively Suitable Lands Not Appropriate for Timber Production," takes into account how management varies based on the alternatives being considered.

Table G-2. Calculation of acres of land tentatively suitable for timber production by alternative

Land Category	Acres for All Alternatives
All Coconino NF Lands	**1,842,964**
Non forested	-991,067
Withdrawn lands	-110,587
Irreversible resource damage	-48,495
Adequate restocking not assured	-79,564
Lands Tentatively Suitable for Timber Production	**613,251**

Financial Evaluation

The 1982 Planning Rule provisions at Section 219.14(b) require that tentatively suitable forest lands shall be further reviewed and assessed to determine the costs and benefits for a range of management intensities for timber production. To meet this requirement, the Coconino NF used the Financial Evaluation 219.14b spreadsheet (Timber Feasibility Analysis) provided by the Southwestern Regional Office, which can be found in the project record. The spreadsheet incorporates information regarding harvest volumes, revenues, and costs over time to calculate the per acre present net value (PNV) and benefit/cost ratios at discount rates of 3, 4, and 7 percent (Table G-3 and Table G-4). This was completed based on the guidelines contained in plan alternatives for acres identified as tentatively suitable. The results from this financial evaluation were combined with other categories that relate to Lands Tentatively Suitable for Timber Production as part of the effort to determine Lands Suitable for Timber Production (see Table G-2 above).

The management intensities/prescriptions applied in alternatives and analyzed are: free thin all sizes to target basal area (BA) of 50, and group select with matrix thin to target BA of 60 (Ponderosa Pine) or 70 square feet per acre (Mixed Conifer with Frequent Fire). These intensities/prescriptions were applied to three different operational scenarios for Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs: Tractor ground – roaded, Tractor ground – unroaded, and Cable/Helicopter ground. Tractor-roaded includes all tentatively suitable acres within a quarter of a mile of the nearest road. Tractor-unroaded includes all tentatively suitable acres greater than a quarter of a mile from the nearest road. Cable/Helicopter ground includes all tentatively suitable acres on slopes greater than 40 percent.

Volumes were based on the average yield per acre from the calculations based on acres treated for the Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs (see Table G-3 and Table G-4 below). Revenues per thousand cubic feet (MCF) were based on the Transaction Evidence Appraisal (TEA) Bulletin #1, Calendar Year 12, 4th Quarter (January). Costs included harvest preparation and administration, fuel treatment, stocking surveys, stand release (prescribed burns), non-merchantable thins, necessary mitigation, and roads (reconstruction and maintenance). Under these cost and revenue assumptions, all estimated net revenues were negative. Management on Tractor ground – roaded produced the lowest negative (i.e., most positive) net values. All operational scenarios produced positive benefit/cost ratios except Cable/helicopter ground.

Table G-3. Per acre present net value (PNV) and benefit/cost ratios for Ponderosa Pine

Combination Free Thin -Group Selection	Percent Net Revenue	Benefit/Cost Ratio
Tractor Ground - Roaded		
Undiscounted net revenue	-$2,938.56	0.47
PNV at 3%	-$751.05	0.54
PNV at 4%	-$587.56	0.56
PNV at 7%	-$371.40	0.61
Tractor Ground - Unroaded		
Undiscounted net revenue	-$5,207.07	0.077
PNV at 3%	-$1,623.75	0.084
PNV at 4%	-$1,350.51	0.086
PNV at 7%	-$990.60	0.089
Cable/Helicopter Ground		
Undiscounted net revenue	-$18,492.66	-0.039
PNV at 3%	-$5,501.84	-0.046
PNV at 4%	-$4,501.96	-0.047
PNV at 7%	-$3,185.81	-0.051

Table G-4. Per acre present net value (PNV) and benefit/cost ratios for Mixed Conifer with Frequent Fire

Combination Free Thin -Group Selection	Percent Net Revenue	Benefit/Cost Ratio
Tractor Ground - Roaded		
Undiscounted net revenue	-$5,962.34	0.019
PNV at 3%	-$1,766.11	0.021
PNV at 4%	-$1,445.10	0.022
PNV at 7%	-$1,022.66	0.024
Tractor Ground - Unroaded		
Undiscounted net revenue	-$5,638.08	0.00059
PNV at 3%	-$1,771.46	0.00063
PNV at 4%	-$1,475.95	0.00064
PNV at 7%	-$1,086.86	0.00067
Cable/Helicopter Ground		
Undiscounted net revenue	-$19,337.16	-0.0022
PNV at 3%	-$5,288.59	-0.0027
PNV at 4%	-$4,312.82	-0.0028
PNV at 7%	-$3,039.07	-0.0030

The 1982 Planning Rule provisions at Section 219.14(c) require a consideration of costs and benefits for alternative management of the lands as identified in 219.14.b. Management prescriptions (in this case for timber harvest) shall be defined **to meet management objectives** for the various multiple uses including outdoor recreation, timber, watershed, range, wildlife and fish, and wilderness. It should be noted that in alternatives B (modified), C, and D, there are no objectives for timber output (MBF, MCF, or CCF), but there are objectives for acres of mechanical treatment. Unlike the 1987 plan, alternatives B (modified), C, and D are focused on *outcomes*, not *outputs*. Movement toward desired conditions and resilient landscapes is more valuable than revenue received.

Lands were identified as "Suitable for Timber Production" if achieving and maintaining the desired conditions and objectives would involve planned, periodic timber harvest activities and include planned regeneration of the stand. Designation of Lands Suitable for Timber Production does not imply that management would be focused on maximizing timber yields, only that periodic harvests are expected to occur as a tool for achieving or maintaining desired conditions (USDA Forest Service 2012a).

The plan Need for Change relative to the mechanical harvest of trees is under Maintenance and Improvement of Ecosystem Health:

- Incorporate desired conditions that reflect the composition, structure, and natural disturbance attributes appropriate for the different ecosystems and that are integrated across different resource areas.

The provisions of the 1982 Planning Rule at Section 219.12(f)(8) state that each alternative shall represent to the extent practicable the most cost-efficient combination of management prescriptions examined that can *meet the objectives established in the alternative.*

The ground-based tractor operational scenario within a quarter of a mile of the nearest road is the most cost-efficient approach for Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs (Table G-3 and Table G-4). This is based on achieving the least negative net revenue using a management prescription combining free thin all sizes to target BA of 50 and group selection with matrix thin to a target BA of 60 square feet per acre.

Long-term Sustained Yield Capacity (LTSYC)

Lands designated as suitable for timber production provide the base for calculating the LTSYC of the forest. These lands can either be designated by mapping or they can be expressed as a percentage of the lands classed as "Tentatively Suitable for Timber Production." The latter approach assumes that within larger areas that are classed "Suitable for Timber Production," there may be scattered inclusions of areas that are more appropriately managed as "Unsuitable for Timber Production" lands.

During plan development or plan revision and, as appropriate, for plan amendment, the responsible official shall estimate the amount of timber that could be harvested annually in perpetuity on a sustained-yield basis from land where timber harvest could occur, once these lands are in their desired condition.

LTSYC is computed based upon the premise that periodic harvest and regeneration is desired or necessary to meet land management desired conditions. Desired conditions are based upon multiple use objectives. Highest potential yield was not an objective in any alternative. The cutting methods and silvicultural management strategy used for these calculations are consistent with the stated land management objectives.

NFMA states that the Secretary of Agriculture shall assure that plans for forest management provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple-Use, Sustained-Yield Act of 1960, and in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness. "Sustained yield of the products and services" means the achievement and maintenance in perpetuity of a high annual or regular periodic level of output of the various renewable resources of the national forests without impairment of the productivity of the land. NFMA requires the agency to estimate, in the land management plan, the amount of commercial wood products that may be sustainably harvested over

a long period. This sustainable harvest estimate assumes that lands are already in their desired condition. In reality, most forest lands are not in a desired condition so planners use mathematical models to estimate sustainable harvest levels and show planned progress toward the achievement of desired conditions and LTSYC levels of harvest. Short-term harvest levels on lands where timber production is a regular, predictable activity would tend to steadily increase or decrease until those lands are at a desired condition and then remain steady around that level.

Coconino NF Approach to LTSYC Analysis

Desired conditions, and their contributions to social, economic, and ecological sustainability, are the vision that drives the forest plan revision and implementation process; for example, see the following sample of citations describing the 1982 Planning Rule procedures taken from "National Forest System Land and Resource Management Planning," 36 CFR § 219 (1999):

- Sec 219.11: "Forest Plan Content. The Forest Plan shall contain the following…Forest multiple-use goals and objectives that include a description of the desired future condition of the forest or grassland…."
- Sec 219.1 "Purpose and principles.
    - (a)(1) "The resulting plans shall provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long term net public benefits in an environmentally sound manner."
    - (b)(1) "Establishment of goals and objectives for multiple-use and sustained-yield management of renewable resources without impairment of the productivity of the land;
    - (b)(2) "Consideration of the relative values of all renewable resources, including the relationship of nonrenewable resources, such as minerals, to renewable resources;
    - (b)(3) "Recognition that the National Forests are ecosystems and their management for goods and services requires an awareness and consideration of the interrelationships among plants, animals, soil, water, air, and other environmental factors within such ecosystems;
    - (b)(4) "Protection and, where appropriate, improvement of the quality of renewable resources…."

Based upon this direction, the Southwestern Region has adopted a regionally consistent set of desired condition visions for forested ecological response units (ERUs). Due to these common desired condition visions, it is reasonable to analyze LTSYC in a consistent fashion for all national forests in the Southwestern Region. For this effort, alternatives B (modified) and D rely on this set of desired conditions. However, alternatives A and C differ in that they retain the old growth direction from the 1987 plan, requiring at least 20 percent of the naturally forested area by forest type in any landscape be developed to retain old growth function. Because these forested areas would be managed to retain a minimum of twenty 18-inch trees per acre with at least 90 square feet of basal area per acre and 50 percent canopy cover, they were removed from the suitable timber base. Management for these conditions differs from the regionally consistent desired conditions which strive to create uneven-aged structure and maintain old growth attributes across the landscape, not just on 20 percent of the area. The LTSYC for alternatives A and C apply to the 80 percent not to be managed specifically for old growth. The 20 percent to be managed for old growth was removed from Suitable Timberlands and was not included in the LTSYC.

The following assumptions were used as the basis for the Coconino NF's LTSYC analyses for all alternatives:

LTSYC calculations are based upon uneven-aged forest management systems for the following forest ERUs on the Coconino NF:

- Ponderosa Pine Forest (PPF) and its sub-types (PP-Grass and PP-Gambel oak)
- Mixed Conifer with Frequent Fire (assumes management favors retention of shade-intolerant species)
- Mixed Conifer with Infrequent Fire (assumes management favors retention of wind-firm species; Douglas-fir, southwestern white pine, although other species are represented and desired)

The uneven-aged management strategy assumed for analysis:

- Group selection cutting in mid and very large diameter states
- 5 age groups, 40-year cutting cycle, and 20-year intermediate thinning. The target density matrix[26] varies by ERU, for example in high site index Ponderosa Pine types, the target matrix basal area is 60, while in Mixed Conifer with Frequent Fire the target matrix density has a basal area of 70.

Analysis methods used included:

- Region-wide Forest Inventory Analysis (FIA) plot data, sorted by ERU and site index
- Forest Vegetation Simulator (FVS) – regionally calibrated
- Mortality
- Growth
- Seen defect
- Merchantable cubic feet volumes (5-inch+ d.b.h., 4-inch minimum top DIB[27])
- Merchantable board feet volumes (9-inch+ d.b.h., 6-inch minimum top DIB)

Overview/Assumptions:

The Long-Term-Sustained Yield Capacity (LTSYC) is a theoretical calculation based upon achieving a "regulated[28]" uneven-aged condition across the landscape, meaning that there would be more or less balanced age classes, from young to old, at desired densities that are able to cycle through time maintaining the desired uneven-aged distribution (i.e., even-flow). Each subsequent harvest entry (approximately every 20 years) would strive to adjust stocking levels to continue to move toward desired conditions. The LTSYC is based upon harvest volumes derived from Forest Inventory

[26] In uneven-aged silviculture, "matrix" refers to the forested area surrounding regeneration groups (group selection) that receives thinning each cutting cycle until it is time to be regenerated again. The matrix accounts for the bulk of a stand or harvest area.
[27] DIB stands for diameter inside bark, which provides for more accurate calculation of tree volume by subtracting bark thickness from the calculation.
[28] The technical (in contrast to the administrative and business) aspects of controlling stocking, harvests, growth, and yields to meet management objectives including sustained yield. A direct method of controlling and determining the amount of timber to be cut annually or periodically by calculations based on growing stock volume and increment. Society of American Foresters Online Dictionary (https://forested.remote-learner.net/mod/glossary/view.php?id=367&mode=letter&hook=F&sortkey=&sortorder=asc&fullsearch=0&page=20) accessed February 6, 2018.

Analysis (FIA) data averaged across the Southwestern Region, and the percentage of high versus low site quality index of ponderosa pine acres across the forest.

Site quality (index) for ponderosa pine forest-wide was determined by looking at Field Sampled Vegetation (FSVeg) and Forest Inventory Analysis (FIA) data taken over the past decade. Using a site index of 70 (Minor) as the break between high and low sites, 1,382 out of 1,641 stands (84 percent) in FSVeg rated as high site quality; while only 62 out of 202 FIA plots (31 percent) rated as high site quality. Because of budgetary constraints, data collected for FSVeg is typically concentrated in higher site quality stands that have a greater chance for treatment on the ground. As a result, it is believed that the FSVeg number of 84 percent is skewed to the high side. Conversely, FIA data is a much coarser sample that puts no weight on site quality, thus even unproductive timberlands are sampled. When averaged together, the high versus low site ratio is 78:22, which was rounded down to a 75 percent high site quality index across the forest. The LTSYC was calculated assuming that 75 percent of the ponderosa pine type is capable of growing 22.5 cubic feet per acre per year, and 25 percent is capable of growing 15.5 cubic feet per acre per year. Both the mixed conifer with frequent fire type (MCD) and the mixed conifer with infrequent fire type (MCW) were also used to calculate LTSYC. The mixed conifer types cumulatively represent a little less than 8 percent of the total suitable acres. As with the ponderosa pine type, the average site index for each was calculated based on FIA data (MCD: 18.2 cubic feet per acre per year and MCW: 19.9 cubic feet per acre per year). However, these types were not further divided into high and low site quality.

Allowable Sale Quantity

Section 13 of the NFMA (Limitations on timber removal) and Section 219.16 of the 1982 Planning Rule provisions (Timber resource sale schedule) require that timber harvest levels be based on the principle of sustained yield. Long-term sustained yield capacity (LTSYC) is the uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity that is consistent with multiple-use objectives. Allowable sale quantity (ASQ) is the quantity of timber that is planned to be sold from the suitable timberland covered by the forest plan for a time period specified by the plan. ASQ is usually expressed on an annual basis as the "average annual allowable sale quantity" because it may be exceeded in a given year as long as the 10-year average is not exceeded. ASQ and LTSYC apply only to those lands that are suitable for timber production. That is, where there is the intent to have regular harvests for the purpose of producing commercial timber products, while managing for other resource objectives.

These provisions allow for the establishment of an ASQ to depart from (exceed) the projected LTSYC provided that such planned departure is consistent with and leads to the better attainment of multiple use management objectives.

For the purposes of this analysis, ASQ was calculated based on the Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs. The Mixed Conifer with Infrequent Fire ERU was not included in the calculation of ASQ, as it represents only a minor component of the land suitable for timber production (slightly over 1 percent). The Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs are highly departed in terms of density, structure, and susceptibility to unnaturally high-severity crown fire. To make progress toward desired conditions for the Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs, timber harvest levels will have to be substantially greater than the estimated LTSYC until such time as desired conditions (e.g., reduced tree density, uneven-aged structure, and reduced crown fire risk) are attained. LTSYC is roughly equivalent to growth/production that can be sustained over time. However, LTSYC is only applicable once the desired density and structure have been achieved.

LTSYC calculation guidance provided by the Southwestern Region (USDA Forest Service 2012a) was used for the LTSYC estimates for the Coconino NF. Table G-5 displays the ASQ and LTSYC for each alternative.

Table G-5. Average Annual Allowable Sale Quantity and Long-term Sustained Yield Capacity, Volumes (CCF) by alternative

	Alternative A	Alternative B (modified)	Alternative C	Alternative D
Allowable Sale Quantity	175,723 CCF	196,809 CCF	175,396 CCF	196,809 CCF
Long-term Sustained Yield Capacity	96,337 CCF	107,929 CCF	96,085 CCF	107,994 CCF

[1] CCF = one hundred cubic feet

All Alternatives

The ASQ for all alternatives is projected to be well above the LTSYC calculations for all alternatives (9.6 million CF per decade for alternatives A and C, and 10.8 million CF per decade for alternatives B (modified) and D) for the next 5 decades. Existing forest conditions are dominated by single-storied (even-aged), closed canopy states consisting of primarily medium-sized (10- to 20-inch d.b.h.) trees. Because of existing overstocked forest conditions and high level of departure, it may take 80 to100 years to reach regulation (USDA Forest Service 2012a) and desired conditions. Suitable timberlands are currently denser, less structurally diverse, and more prone to crown fires than desired. As a result, all alternatives have an ASQ that is higher than LTSYC. This planned departure from the LTSYC would be necessary through the next century to achieve the desired density and structure consistent with other multiple-use objectives (Figure G-1).

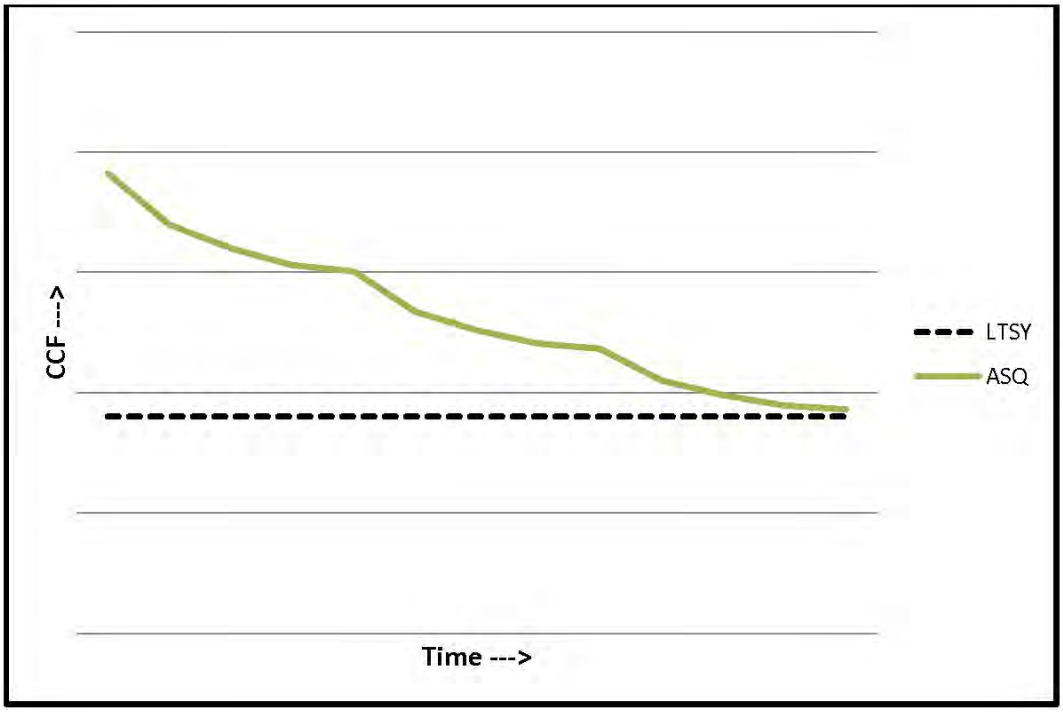

Figure G-1. Estimated departure pattern between ASQ and LTSYC for all alternatives

Figure G-1 assumes full capacity to implement mechanical thinning at the rate identified in the objectives in the proposed revised plan. Actual capacity may be limited due to lack of infrastructure,

budget, or successful project planning. Although the estimated number of years in each phase of departure would vary depending on the actual implementation rates, the pattern is expected to remain roughly the same. The total time from plan implementation to achievement of the desired density and structure is estimated to be approximately 100 years, with a minimum of 20 years between treatments designed to achieve uneven-aged structure. Note that due to the current lack of infrastructure, the volumes during the first period may actually start below the ASQ and climb before flattening out at or near the ASQ.

Simulated treatments of uneven-aged group selection and free thinning would sustain harvests at approximately 19 million cubic feet per decade for the first 10 years, and then slowly decline. Based upon the objective of silviculturally treating 27,550 acres per year (26,050 ponderosa pine acres and 1,500 mixed conifer frequent fire acres), much of the overstocked acres would be treated in the first two decades, which is partially why the ASQ exceeds the LTSYC by such a large margin. The first 2 decades would reduce stand densities and start the landscape on an uneven-aged trajectory moving toward desired conditions. Over the following 3 decades, structure would continue to be adjusted as the proportion of open, uneven-aged states would begin to equal the closed even-aged states and the ASQ quantity would begin to level off between 13 and 15 million CF per decade.

Initially, the forest would focus mechanical thinning efforts in the areas most at risk of loss. These are the areas containing the greatest percentage of dense states that are dominated by trees in the larger size classes. These states are given higher priority because they are at risk of loss from uncharacteristic high-intensity wildfire, and it would take longer to replace the larger trees if they are lost (more than 100 years). Stands that are currently uneven-aged and dense, but are also dominated by large trees could potentially be treated to the desired open, uneven-aged state in one treatment. Once the desired density and structure is achieved, the areas would no longer contribute to the vegetative departure.

In even-aged, dense, large tree dominated sites, the desired density would be achieved after the initial treatment. However, these areas would not have the desired uneven-aged structure, even with the new age cohort (regeneration) that would result from the initial treatment. These two-aged areas would be scheduled for additional treatments to regenerate additional cohorts, creating desired uneven-aged conditions.

Once all of the suitable areas in the dense, large tree states (H, I, L, and M) have had one treatment (minimum of 25 years), the volume would drop and stabilize for another 1 or 2 decades, even though the implementation rate for mechanical restoration would be similar to the first period. During this second phase, the original dense even-aged states would receive a second treatment establishing new regeneration, and the younger dense states (F and G) would receive their first treatments. While implementation rates are expected to be stable, lower yields would likely result because the smaller dense states yield about half the volume of the larger states and because the intensity of treatments on the second treatment of the areas in the larger states is expected to be lower than the first treatment. With a second treatment establishing a third age class, most of these stands would be in the desired uneven-aged, open state and would no longer contribute to the departure.

In the third phase, the volumes would drop again to just above the LTSYC level and then taper off to a zero departure, where harvest/ASQ would be equal to LTSYC. During this last phase of departure, the areas with one or two age classes would receive their final restructuring treatments to establish regeneration and reduce density which would release the largest trees (component most lacking) so that they may grow more quickly and achieve the desired larger diameters. When all suitable timberlands are in the desired open, uneven-aged condition, the yield of wood produced and

harvested would stabilize at the identified LTSYC. All treatments thereafter would focus on maintaining the desired conditions over time, while yielding a sustainable supply of wood in perpetuity.

Note that commercial wood volume may be produced from restoration treatments or other management to meet resource objectives on non-suitable timberland. On non-suitable timberland, mechanical thinning would only be used to achieve the desired stand structure and density. Thereafter, the desired density would be maintained with fire. There is no long-term sustained yield or allowable sale quantity assigned to non-suitable areas.

See Table G-6 through Table G-11 for detailed ASQ calculations for the Ponderosa Pine and Mixed Conifer with Frequent Fire ERUs for all alternatives based on the VDDT of the high treatment objective.

Key for VDDT States in Table G-6 through Table G-11

C_SMO = small, open;

D_MOS = medium, open, single story;

E_VOS = very large, open, single story;

F_SSC = seedling/sapling, closed;

G_SMC = small, closed;

H_MCS = medium, closed, single story;

I_VCS = very large, closed, single story;

J_MOM = medium, open, multistory;

K_VOM = very large, open, multistory;

L_MCM = medium, closed, multistory;

M_VCM = very large, closed, multistory

Table G-6. Average yield per acre (CF) in Ponderosa Pine ERU, by prescription, by applicable VDDT State (1st Decade)

Rx	Size	Alt	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
Free thin all sizes to target BA	5 - 9" d.b.h.	All	37.12			96.28	353.81						
	9+" d.b.h.	All	1.77			316.96	319.32						
Group selection with matrix thin	5 - 9" d.b.h.	All		32.52				163.46	9.74	19.99	5.09	143.55	81.04
	9+" d.b.h.	All		203.07	587.41			756.62	1,648.36	393.38	613.44	919.18	1,413.02

* Displayed values are rounded.

Table G-7. Average annual acres treated, in Ponderosa Pine ERU, by prescription, by applicable VDDT State (1st Decade)

Rx	Alt	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
Free thin all sizes to target BA	A	2,387			434	651						
	B (modified)	2,678			487	730						
	C	2,382			433	650						
	D	2,678			487	730						
Group selection with matrix thin	A		759	325			6,835	1,085	2,061	1,736	4,339	651
	B (modified)		852	365			7,668	1,217	2,313	1,947	4,869	730
	C		758	325			6,821	1,083	2,057	1,732	4,331	650
	D		852	365			7,668	1,217	2,313	1,947	4,869	730

* Displayed values are rounded.

Table G-8. Average annual yield (cubic feet), in Ponderosa Pine ERU, by prescription, by applicable VDDT State

Rx	Size	Alt.	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
Free thin all sizes to target BA	5 - 9" d.b.h.	A	88,607			41,785	230,330						
		B (modified)	99,409			46,888	258,281						
		C	88,421			41,689	229,976						
		D	99,409			46,888	258,281						
	9+" d.b.h.	A	4,215			137,561	207,879						
		B (modified)	4,728			154,360	233,106						
		C	4,206			137,244	207,560						
		D	4,728			154,360	233,106						
Group selection with matrix thin	5 - 9" d.b.h.	A		24,682				1,117,242	10,570	41,199	8,832	622,845	52,756
		B (modified)		27,706				1,253,404	11,856	46,237	9,906	698,924	59,158
		C		24,650				1,114,954	10,551	41,119	8,812	621,696	52,675
		D		27,706				1,253,404	11,856	46,237	9,906	698,924	59,158
	9+" d.b.h.	A		154,127	190,909			5,171,484	1,788,473	810,759	1,064,935	3,988,313	919,876
		B (modified)		173,013	214,406			5,801,747	2,006,057	909,891	1,194,371	4,475,477	1,031,505
		C		153,924	190,909			5,160,891	1,785,176	809,185	1,062,481	3,980,960	918,463
		D		173,013	214,406			5,801,747	2,006,057	909,891	1,194,371	4,475,477	1,031,505

* Displayed values are rounded.

Table G-9. Average yield per acre (CF) in Mixed Conifer FF ERU, by prescription, by applicable VDDT State (1st Decade)

Rx	Size	Alt.	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
Free thin all sizes to target BA	5 - 9" d.b.h.	All				36.97	247.57						
	9+" d.b.h.	All	2.47			416.73	987.15						
Group selection with matrix thin	5 - 9" d.b.h.	All						129.85		15.84		106.55	13.74
	9+" d.b.h.	All		31.38				748.70	1,530.37	65.96	367.04	658.07	1,008.88

* Displayed values are rounded.

Table G-10. Average annual acres treated, in Mixed Conifer FF ERU, by prescription, by applicable VDDT State

Rx	Alt	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
Free thin all sizes to target BA	A	6			58	97						
	B (modified)	7			63	106						
	C	6			58	97						
	D	7			63	106						
Group selection with matrix thin	A		26				208	39	91	156	493	117
	B (modified)		28				225	42	99	169	535	127
	C		26				207	39	91	156	493	117
	D		28				225	42	99	169	535	127

* Displayed values are rounded.

Table G-11. Average annual yield (cubic feet), in Mixed Conifer FF ERU, by prescription, by applicable VDDT State

Rx	Size	Alternative	C_SMO	D_MOS	E_VOS	F_SSC	G_SMC	H_MCS	I_VCS	J_MOM	K_VOM	L_MCM	M_VCM
Free thin all sizes to target BA	5 - 9" d.b.h.	A				2,144	24,014						
		B (modified)				2,329	26,242						
		C				2,144	24,014						
		D				2,329	26,242						
	9+" d.b.h.	A	15			23,774	40,423						
		B (modified)	17			25,823	44,173						
		C	15			23,774	40,423						
		D	17			25,823	44,173						
Group selection with matrix thin	5 - 9" d.b.h.	A						27,009		1,442		52,530	1,608
		B (modified)						29,216		1,568		57,005	1,746
		C						26,879		1,442		52,530	1,608
		D						29,216		1,568		57,005	1,746
	9+" d.b.h.	A		816				155,729	59,684	6,003	57,259	324,430	118,039
		B (modified)		879				168457	64,276	6,530	62,030	352,069	128,127
		C		816				154980	59,684	6,003	57,259	324,430	118,039
		D		879				168457	64,276	6,530	62,030	352,069	128,127

* Displayed values are rounded.

Timber Sale Schedule

The timber sale schedule for the Coconino NF is formulated to provide for a forest structure that would enable perpetual timber harvest which meets the principle of sustained-yield and multiple-use objectives of the alternative (1982 Planning Rule, section 219.16 (a)(2)(iv)). For the base sale schedules, the planned sale for any future decade shall be equal to, or greater than, the planned sale for the preceding decade, provided that the planned sale is not greater than the long-term sustained-yield capacity consistent with the management objectives of the alternative (section 219.16 (a)(1). Alternatives with sale schedules which depart from the principles of paragraph (a)(1) of this section and which would lead to better attaining the overall objectives of multiple-use management shall be evaluated when any of the following conditions are indicated:

- (i) None of the other alternatives considered provides a sale schedule that achieves the assigned goals of the RPA Program as provided in Sec. 219.4(b);
- (ii) High mortality losses from any cause can be substantially reduced or prevented or forest age-class distribution can be improved, thereby facilitating future sustained-yield management; or
- (iii) Implementation of the corresponding base sale schedule would cause a substantial adverse impact upon a community in the economic area in which the forest is located.
- (iv) It is reasonable to expect that overall multiple-use objectives would otherwise be better attained.

Conditions (ii) and (iv) both apply to the Coconino NF.

Table G-12 outlines the expected maximum harvest volumes for the Coconino NF for the 10 years following plan approval. The total of these volumes is the allowable sale quantity (ASQ) for the decade. For example, under alternative B (modified), the ASQ for the first decade is 1,968,091 CCF (hundred cubic feet).

Table G-12. Expected maximum harvest levels per decade

Alternative	Vegetation Type	Acres	Pulp (ccf)	Saw (ccf)	Total (ccf)
A	Ponderosa Pine Forest	212,630	223,885	1,443,853	1,667,738
	Mixed Conifer with Frequent Fire	12,910	10,875	78,617	89,492
	Totals	**225,540**	**234,760**	**1,522,470**	**1,757,230**
B (modified)	Ponderosa Pine Forest	238,560	251,177	1,619,866	1,871,043
	Mixed Conifer with Frequent Fire	14,010	11,811	85,238	97,049
	Totals	**252,570**	**262,988**	**1,705,104**	**1,968,091**
C	Ponderosa Pine Forest	212,220	223,454	1,441,100	1,664,554
	Mixed Conifer with Frequent Fire	12,900	10,862	78,542	89,404
	Totals	**225,120**	**234,316**	**1,519,642**	**1,753,958**
D	Ponderosa Pine Forest	238,560	251,177	1,619,866	1,871,043
	Mixed Conifer with Frequent Fire	14,010	11,811	85,238	97,049
	Totals	**252,570**	**262,988**	**1,705,104**	**1,968,091**

References for Appendix G

Montana State University (MSU). 2006. Montana Forest Products Marketing News. Missoula, MT: Extension Forestry Branch. [online] http://www.msuextension.org/forestry/ForestProducts/MFPMNJuly06.pdf

U.S. Department of Agriculture (USDA), Forest Service. 2012a. National Forest Planning and Sustained Yield of the Timber Resource Long-Term Sustained-Yield Calculations for Forest Land and Resource Management Planning. White paper prepared by J. Youtz and D. Vandendriesche. Albuquerque, NM: Southwestern Regional Office. 32 pp.

U.S. Department of Agriculture (USDA), Forest Service. 2012b. Vegetation and Fire Specialist Report Forest Plan Revision DEIS. Flagstaff, AZ: Coconino National Forest.

Appendix H. Other Supporting EIS Documentation

The documents listed below and other supporting documentation for this plan revision effort may be found at the Coconino National Forest Plan Revision Project website (https://go.usa.gov/xRPZd).

- Analysis of the Management Situation (AMS)
- Ecological Sustainability Report (ESR)
- Economic and Social Sustainability Assessment (ESSA)
- Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds on the Coconino, Kaibab, and Prescott National Forests
- Southwestern Region Climate Change Trends and Forest Planning
- Potential Wilderness Area Evaluation
- Wild and Scenic River Eligibility Evaluation
- Research Natural Areas Evaluations
- Specialists' Reports for the Final Environmental Impact Statement